THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Buyers' general expectation of lower prices is the pivot on which the iron market still turns. What readjustments the various associations will make in view of the marked falling off in consumption; how far the hesitancy and caution which have come into all industrial operations will carry the market; to what extent the curtailed consuming power resulting from the idleness of many thousands of workers will be reflected in the iron trade—these are a few of the questions the situation is propounding. Manufacturers of plates, structural material and steel bars are agreed—and many consumers of those products are in accord with the view—that any reductions in price at this time, unless it were an extreme one, would not stimulate buying. And sellers have found, in connection with the declines already recorded, that even to have bought below what was the market at the time of contracting does not prevent buyers from seeking readjustments when lower market levels are reached. For the present both sides of the market are willing to jog along with wide open eyes, looking sharply for signs of impending changes. The shutting down and starting of iron and steel works are so mingled in the news of each week that the net result might be missed but for the knowledge that the volume of new business and specifications on old are painfully in contrast with what was done one year ago or even six months ago. The railroads, that have been the backbone of the unparalleled good times of the past three years, are leading in the restrictive process, and it would seem that this period of light consumption is to be prolonged until money becomes so plentiful that the railroads can advantageously take up again their programs of extension. A noteworthy feature of the situation in the iron trade is the general confidence in the efficacy of the restrictive policy. The blast furnace companies of the Central West have practically enforced a 40 percent reduction of output, though having only agreed to cut down 25 percent. It is likely that the meeting to be held next week will decide to run at one-half capacity for the remainder of the year. In Ohio and Western Pennsylvania seven furnaces went out last week and two resumed, making the number now idle 26. The Eastern furnaces are working out their curtailment plans, but in the South there is no concert of action. There the fittest will persist. Some furnaces are on their cost line now, $10 for No. 2 foundry having been commonly done recently, and this price has been cut in a few instances. A lot of 5,000 tons of Nos. 3 and 4 to an Ohio pipe works is the largest sale reported. Gray forge has sold more freely also, $8.75 having been reached on this grade. While Southern sellers maintain that the market is stronger after the recent low-priced sales, reports differ on this point. The attitude of Northern furnaces may have somewhat reinforced Southern sellers, as the extreme prices on Southern irons have not been met. Buying of foundry irons is generally of the same limited order as for weeks. Conditions in the steel market point to a recasting of pool prices. Independent makers have sold billets $2 below the agreed schedule, and if a change in the official prices is made, it is likely to be $1 to $2 below present sales from outside mills. Finished material markets are very quiet and in heavier lines far from satisfactory. Steel car manufacturers are somewhat better consumers of plates than in recent weeks, but general demand for plates has dwindled further, causing a shutdown at the Western plate mill. The sheet market shows further concessions, and prices of wire products are about $1 a ton lower. Twenty-three independent coke producers in Western Pennsylvania have formed an organization with a view to maintaining furnace coke at $2 to consumers and foundry coke at $2.85 to consumers, with jobbers' prices 10 cents less. The agreement takes in 3,000 ovens. Other independent producers represent 8,000 ovens, so that the prospect of holding the prices named is not flattering.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Oct. 28.

Pig iron production in the Mahoning and Shenango Valleys and the Wheeling and Pittsburg districts is now curtailed 40 percent, despite the fact that the curtailment program only called for 25 percent of the production. During the week seven stacks have been added to the list of idle furnaces, while two stacks that were banked resumed operations. This makes a total of 26 furnaces that are out of operation, and the list will no doubt be increased during the coming week. A meeting of the same blast furnace interests that decided on the 25 percent curtailment will be held in this city next week for the purpose of increasing the percentage of curtailment from 25 to either 40 or 50 percent. Should 40 percent be agreed upon the production of the districts named above, together with the Cleveland, Columbus and Southern Ohio districts, would be reduced 1,000,000 to 1,200,000 tons up to Jan. 1, while if 50 percent is agreed upon the tonnage cut off will amount to 1,500,000 tons. Large interests that have not banked their furnaces are operating slowly and in that way are adhering to the curtailment program.

A number of idle steel mills resumed operations this week and the indications are that a few additional idle plants will resume in the near future. The Ohio works of the Carnegie Steel Co., Youngstown, O., resumed on billets and tin bars instead of rails, on which the plant has been running all year, the change no doubt being due to the fact that the railroads are withholding specifications temporarily. The idle departments of the American Steel & Wire Co. at Rankin, Pa., were again placed in operation after a brief idleness, while five additional mills of the South Sharon plant of the American Tin Plate Co. resumed. The McKees Rocks plant of the Pressed Steel Car Co. was again placed in partial operation, while twenty mills of the Shenango plant of the American Tin Plate Co., New Castle, Pa., will resume on Nov. 9.

The buying in finished lines continues limited to small lots almost entirely, while iron bars, sheets, wire and cut nails are somewhat weaker, although lower prices are only being quoted on sheets, nails and wire products. While no straight reduction on wire nails and wire products generally has been announced, concessions are being made amounting to $1 per ton. Quotations f. o. b. mill are still made at the base prices, but in cases where the freight is equal to 5 cents per 100 pounds the same base price is quoted as the delivered price. The agreement quotations on cut nails are not being adhered to, concessions of about $3 per ton being freely made. On black and galvanized sheets reductions of from $1 to $2 per ton are being offered. There are persistent rumors that certain mills in the billet association, while not cutting agreed prices,

are offering inducements to prospective purchasers that practically amount to a reduction in the pool prices of from $1 to $2 per ton. Independent producers of open-hearth steel are making cuts of from $2 to $3 per ton, and it is the prevailing opinion that billet prices must soon be readjusted by the association. The pig iron market continues quiet, although the number of transactions is on the increase. Some Southern iron is being sold here in small lots, one sale of 100 tons of No. 2 having been made on the basis of $9.90, Birmingham, while large lots have been offered as low as $9.75, Birmingham, equivalent to $14.10, Pittsburg.

Independent coke producers to the number of 23 met at Uniontown, Pa., last week for the purpose of steadying the present market. It was decided to hold furnace coke at $1.90 to jobbers and $2 to consumers, while foundry coke was fixed at $2.75 to jobbers and $2.85 to consumers. The independent interests represented only 3,000 of the ovens in the upper and lower Connellsville regions, and it is almost a certainty that the agreement will not hold. Such large producers as the Washington Coal & Coke Co., Jamison Coal & Coke Co., Hecla Coke Co., W. J. Rainey, Hostetter Connellsville Coke Co., Bessemer Coke Co., and Brown & Cochran refused to be parties to the agreement. These and other independent interests that refused to enter the meeting operate about 8,000 ovens. At present there are over 6,000 ovens idle in the Connellsville region and the idle list is growing steadily, while production has been curtailed more than 65,000 tons weekly.

Pig Iron.—The banking and blowing out of furnaces in this and the Valley districts has taken a considerable tonnage off the market, and no sales of No. 2 foundry are now being made by Northern producers below $14.25, Pittsburg. This price could no doubt be shaded on a desirable tonnage. The Bessemer iron market is extremely quiet and the quotations are nominally $15 at the furnace. Southern producers are offering their iron freely in this market and sales are being made on the basis of $9.90 to $10.25, Birmingham, equivalent to $14.25 and $14.60, Pittsburg. As low as $9.75 Birmingham on No. 2 has been done on a fair tonnage, however. Seven furnaces were banked and blown out during the week, while two stacks at Youngstown, O., operated by the Carnegie Steel Co. were again placed in operation. The idle stacks are as follows: One Hubbard at Youngstown, O.; Haselton, O., stack of the Republic Iron & Steel Co.; Mary, Lowellville, O.; Girard, Girard, O.; Mabel, Sharpsville, Pa.; Alice, Sharpsville, Pa.; Ella, West Middlesex, Pa.; one stack of the Shenango Furnace Co., Sharpsville, Pa., Kittanning, Kittanning, Pa.; Clinton, Pittsburg, Pa.; Isabella, three stacks, Pittsburg, Pa.; Clairton Steel Co., Clairton, Pa., one stack; Edith, Allegheny, Pa.; two furnaces, Carrie plant, Rankin, Pa.; two Carnegie stacks at Sharon, Pa.; two Carnegie stacks, Bellaire, O.; Niles, Niles, O.; Ohio works No. 3, Youngstown, O.; Edgar Thomson, two stacks, Braddock, Pa.; Neville Island stack, Neville Island, Pa. The output of furnaces in operation is being reduced by slow running and the production in this district and the valleys is now cut down fully 40 percent. We revise quotations of follows:

Bessmer, Valley	$15 00
Bessmer, Pittsburg	15 85
No. 1 Foundry	15 00 to 15 50
No. 2 Foundry	14 25 to 14 75
Gray Forge, Pittsburg	13 50 to 14 00
Chilled Basic, Valley	15 00 to 15 25
Chilled Basic, Pittsburg	15 85 to 16 10

Steel.—It is persistently reported that some of the mills in the billet association are offering inducements to prospective purchasers that really amount to a reduction in quotations of from $1.50 to $2 per ton, although these reductions are not made openly. Independent open-hearth mills are quoting on a basis of $25.50 to $26, Pittsburg, and $25 could no doubt be done on a good tonnage. While no meeting of the billet association has yet been called, it is believed that a meeting will be held shortly for the purpose of readjusting prices on the basis of the present pig iron market. If this is done it is believed that a reduction of $3 or $4 per ton will be made. Agreement quotations remain unchanged as follows: Bessemer billets 4x4 inches and slabs up to and including .25 carbon, $27, Pittsburg, Wheeling or Valley, Johnstown, Ashland, Ky., Ironton, O., and Lorain, O.; .26 to .60 carbon, $1 advance, and .61 to 1.00 carbon, $2 advance; open-hearth billets up to and including .60 carbon, $28, and over .60 carbon, $29; billets smaller than 3⅞-inch and sheet and tin bars are $1 per ton extra; Bessemer rods, $34.50 to $35, and open-hearth are held at $1 advance.

Ferro-Manganese.—There has been no change in the price of ferro, 80 percent. Fifty-ton lots are held at $48 delivered at buyer's mill, east of the Mississippi river, while smaller lots are held at $48.50 to $49.

Spelter.—Prime Western grades continue to be held at 5.58½c to 5.63½c, Pittsburg, in carload lots.

Muck Bar.—There have been no transactions in muck iron during the week and the market is nominally quoted at $27.25 to $27.50.

Skelp.—Both grooved and sheared iron skelp are held at 1.60c to 1.65c, while steel skelp is held at 1.55c to 1.60c.

Rails and Track Material.—The withholding of specifications on the part of the railroads has resulted in placing the Ohio plant of the Carnegie Steel Co. on billets and tin bars. Little new business is being placed. We make the following quotations: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 8 pounds, in carload lots, $39; less than carload lots, $40; 12 pounds, $32 to $32.50; 16 and 20 pounds, $30.50 to $31; 25 to 40 pounds, $30. Track material: Spikes, 2.05c to 2.10c; track bolts, square nuts, 2.50c; hexagon nuts, 2.65c; fish plates, 1.60c on orders accompanying large rail contracts, otherwise 2c to 2.10c is asked.

Plates.—The McKees Rocks plant of the Pressed Steel Car Co. was placed in partial operation this week and a considerable tonnage of plates will be required to fill the orders in hand. There is little general buying and the production has been greatly curtailed. We make the following quotations: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plates more than 100 inches, 5c extra 100 pounds. Plate 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

Bars.—The buying of steel bars continues in small lots for immediate shipment, consumers not buying heavily, believing that lower prices will be named in the near future. Up to the present, however, agreed prices are being maintained. Iron bars are being quoted on the basis of 1.35c to 1.40c, Pittsburg. We make the following quotations: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer, under 3 inches, 1.70c; over 3 inches, 1.80c; common bar iron, 1.35 to 1.40c, Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

Structural Material.—The market remains quiet and no general resumption of buying is anticipated by the mills before the first of the year. We make the following quotations: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles, from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

Sheets.—Further concessions are being named on both black and galvanized sheets and the amount of business that is being offered is not nearly sufficient to keep half the capacity of the country in operation. We revise quotations on black sheets in 500 bundle lots and over as follows: No. 28, 2.60c to 2.65c; No. 27, 2.50c to 2.55c; No. 26, 2.40c to 2.45c; Nos. 22 and 24, 2.30c to 2.35c; Nos. 18 and 20, 2.20c to 2.25c; Nos. 14 and 16, 2.10c to 2.15c; Nos. 10 and 12, 2.00c to 2.05c. Galvanized: No. 16, 2.50c to

2.55c; No. 18-20, 2.75c to 2.80c; No. 22-24, 3.00c to 3.05c; No. 25-26, 3.25c to 3.30c; No. 27, 3.50c to 3.55c; No. 28, 3.75 to 3.80c; No. 29, 4.25c to 4.30c; No. 30, 4.40c to 4.45c.

Wire and Wire Nails.—Concessions of 5 cents per 100 pounds are being named on wire and wire nails, the mills making a freight allowance on delivered quotations. On the other hand the regular base prices are being named on all quotations f. o. b. mill. The agreement quotations of cut nails are not being maintained, reductions of from 10 to 15 cents per 100 pounds being allowed. The cut nail market is very quiet and the demand for wire products has fallen off to some extent. We revise quotations as follows: Wire nails, carload lots, to jobbers, f. o. b. cars, Pittsburg, $1.95 to $2; plain wire, carload lots, $1.85 to $1.90; barb wire, carload lots, $2.25 to $2.30; staples, carload lots, $2.15 to $2.20. Galvanizing 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $2 to $2.05, and less than carload lots, $2.05 to $2.10, f. o. b. Pittsburg, plus freight to point of destination. Iron cut nails are $2.05 to $2.10 in carload lots and $2.10 to $2.15 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

Pipes and Tubes.—Independent producers continue to quote 2½ percent below the prices of the National Tube Co., but despite these concessions the largest producer is taxing the capacity of all its mills to fill orders. We quote as follows in carload lots to consumers, f. o. b. Pittsburg, plus freight according to Tube Rate Book to destination:

MERCHANT PIPE.

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Wrought Iron Pipe. Black. Percent.	Wrought Iron Pipe. Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inch	75	65	72	62
7 to 12 inch	69	59	66	56
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Extra Strong Plain End				
¼ to 8 inch	67	57	63	53
Threads only	66	56	62	52
Threads and Couplings	65	55	61	51
Double Extra Strong Plain End				
½ to 8 inch	59	49	55	45
Threads only	58	48	54	44
Threads and Couplings	57	47	53	43

NOTE.—Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 2 to 6 feet.

BOILER TUBES.

Steel.

	Percent.
1 to 1½ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	52½

Iron.

	Percent.
1 to 1½ inches	36½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	35½

CASING.

	S. and S. Percent.
2 to 3 inches	58
3½ to 4 inches	60
4½ to 12½ inches	63

Merchant Steel.—The market generally is quiet, buying being limited to small lots entirely. The shafting market is also quiet but quotations are being firmly maintained. We make the following quotations: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots. Tire steel, 2.15c to 2.25c; spring steel, 2.25c to 2.35c; toe calk, 2.30c to 2.40c. Tool steel is quoted 7 cents and upwards, according to the grade.

Old Material.—The market still continues in a chaotic state and the mills are not buying any material. Dealers are loading up their yards on all low priced offerings and are holding the same for a better market.

Coke.—More than 6,000 ovens in the Connellsville region are now idle and the list is being added to daily. The quiet condition of the market and the falling off in the demand has resulted in an agreement being entered into by 23 independent producers, representing about 3,000 ovens to hold furnace coke at $2 to consumers and $1.90 to jobbers and foundry, at $2.75 to jobbers and $2.85 to consumers. It is doubtful whether this agreement can hold, as large independent producers not affiliated with this movement are selling furnace coke at $1.80 and foundry at $2.50 to $2.75. These prices apply to strictly first-class Connellsville coke. For the week ending Saturday, Oct. 17, 5,376 of the 22,590 ovens in the upper Connellsville region were idle while 636 of the 5,242 ovens in the lower region were out. The production of the upper region amounted to 182,578 tons, while that of the lower region amounted to 51,000 tons. This is a reduction of the normal output of the entire region of over 65,000 tons.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, Oct. 27.

The interest in Southern pig iron which was so marked after the disruption of the associated furnaces has proved to be only temporary and conditions now are but little better than they were a few weeks ago. When the announcement was made that the association had broken up and that prices had been cut $1 a ton, many melters came into the market with inquiries for lots running into thousands of tons. Time has proved that the bulk of these were merely "feelers," for few consumers have bought more than 500 tons in single lots, while a majority purchased less than this amount. The rapidity with which No. 2 foundry dropped from $11.75 to $10 Birmingham, at which price some furnaces are now accepting orders, has frightened melters generally, and the disposition is now to wait until the market readjusts itself before covering for season requirements.

Interest in finished materials is of the weakest kind. The plate mill at South Chicago, together with the slabbing mill and the open-hearth furnace, was shut down last Saturday because of a scarcity of orders. The 9-inch mill at Milwaukee, which has been working on steel bars, is also shut down. A number of necessary repairs will be made at both plants in the interim, and it is not expected that the suspension will last longer than two weeks. The rod and billet mill of the Illinois Steel Co. at Joliet was started up again yesterday. Sales of bar iron and steel are light, and the former product is now offered on the basis of 1.40c Chicago. Steel bars are still sold with a guarantee against declines. Billets are weaker, and both Bessemer and open-hearth can be purchased from independent mills at $2 a ton less than association prices. A lot of 750 tons of Bessemer billets was sold during the week and an inquiry received for a round tonnage of open-hearth steel. Plates and structural steel are without animation. There is considerable inquiry for standard rails, though little of it results in business. Light rails and track supplies are moving briskly, but the tonnage is not of large proportions. Sheets continue to excite interest by their fluctuations though sales are neither large nor numerous. Merchant pipe and merchant steel are in healthy demand and wire products are also moving freely. Scrap is lower in value than it has been for many months, with but little demand. Coke has also weakened, and standard 72-hour Connellsville is now offered at $2.65 to $2.75 at the ovens.

Pig Iron.—The pig iron market has again dropped into quietness. Foundrymen who two weeks ago were figuring with furnaces for round lots have within the last ten days withdrawn their inquiries and contented themselves with purchases of sufficient proportions to last them a few weeks. The hand-to-mouth policy of buying is again in force, and carload orders predominate in the sales of the week. Inquiries for large lots, however, are still a feature. Scarcely a day passes but several are sent out by foundrymen, some for as high as 2,000 tons; but after getting prices and learning the state of the market the melter generally concludes to buy only a carload or two. Some large transactions have been consummated, however, notably one for 1,500 tons of high grade basic iron for a local consumer, and several for lots of foundry irons ranging from 500 to 1,000 tons. The leading harvester interest is in the market for 1,500 to 2,000 tons for its Canadian plant. Southern No. 2 foundry has touched the $10 Birmingham basis during the week, a sale of 500 tons having been made at this figure by a former member of

the association. The bulk of the sales of the week, however, have been at $10.25 Birmingham. It is noteworthy that Northern irons maintain an even level and have not been affected to the extent that was at first expected by the fluctuations in Southern brands. While reports are current that quotations lower than $15.50 for No. 2 foundry, Chicago, have been made, they cannot be traced. Northern furnaces are booking only a small business, some prefering not to sell at the prices prevailing. The furnace at Spring Valley, Ill., went out of blast last week, which brings the total of idle stacks in this territory to six, including the Zenith at Duluth, Minn.; the Sydney at Mayville, Wis.; two at South Chicago and one at Bridgeport, Ill. We have revised our quotations as follows:

Lake Superior Charcoal	$17 00 to 18 00
Northern Coke Foundry No. 1	16 00 to 16 50
Northern Coke Foundry No. 2	15 50 to 16 00
Northern Coke Foundry No. 3	15 00 to 15 50
Northern Scotch Foundry No. 1	16 00 to 16 50
Ohio Strong Softeners No. 1	17 00 to 17 50
Ohio Strong Softeners No. 2	16 50 to 17 00
Southern Coke Foundry No. 1	14 35 to 14 85
Southern Coke Foundry No. 2	13 85 to 14 35
Southern Coke Foundry No. 3	13 35 to 13 85
Southern Coke Foundry No. 4	12 85 to 13 35
Southern Gray Forge	12 60 to 12 85
Southern Mottled	12 35 to 12 60
Southern Silveries (4% to 6% Silicon)	16 85 to 17 50
Jackson Co. Silveries (6% to 8% Silicon)	17 50 to 18 50
Jackson Co. Silveries (8% to 10% Silicon)	19 00 to 19 50
Alabama and Georgia Car Wheel	21 85 to 22 85
Malleable Bessemer	16 00 to 16 50
Basic Iron	15 10 to 15 60

Billets.—The principal transaction of the week was a lot of 750 tons of Bessemer billets closed by a leading producer at $1 a ton above the schedule price on account of the extras that went with the order. An inquiry for 4,000 to 5,000 tons of open-hearth billets is pending, which with the exception of a few orders for carload lots, represents all that has come up during the week. Generally speaking, billets are weak, and we hear of offers being made by independent manufacturers at $2 a ton below the official schedule of prices. We quote mill shipments, carload lots, Chicago delivery: Bessemer, $26 to $28; open-hearth, $27 to $29, and forging, $30 to $32.

Bars.—Interest centers largely in iron bars, in which competition in this district is very keen. Within the last six weeks, the price of this product has dropped $4 a ton. It is now being offered at 1.40c Chicago, and reports are current that this price has been shaded. Not all the mills in this section, however, have reached this basis, the leading producer stating that 1.45c represents its minimum. Transactions are almost entirely confined to small lots, for which immediate shipment is desired. Steel is quiet and specifications are coming in slowly. The 9-inch steel bar mill at Milwaukee has been shut down because of a scarcity of orders. Demand from store is reported to be light. We quote mill shipments, carload lots, Chicago delivery: Iron, 1.40c to 1.45c; Bessemer steel, 1.76½c; angles, less than 3x3, 1.86½c base; hoops, in lots of 250 tons and greater, 2.06½c; less than this amount, 2.16½c. Quotations from jobbers' stocks, iron, 1.70c to 1.80c; steel, 1.90c to 2c; hoops, 2.30c to 2.40c; angles, 2.10c rates.

Sheets.—A fair demand for both black and galvanized sheets has been felt during the week, though prices are by no means firm. We quote black sheets, mill shipments, Chicago delivery: No. 27, 2.66½c to 2.71½c; No. 28, 2.76½c to 2.81½c. Galvanized, 75, 10 and 2½ percent discount to 75, 10 and 5 percent on mill shipments. On lots from store, we quote No. 27 black, 2.76½c to 2.86½c; No. 28, 2.86½c to 2.96½c.

Plates.—Business has fallen off to such an extent that the leading producer in this territory has shut down its plate mill, which will be kept idle for the next two weeks. Jobbers report that they are booking a fair amount of business, though it is made up of small lots. Prices are held firm without change. We quote mill shipments, Chicago delivery: Tank steel, ¼ inch and heavier, 1.75c; flange steel, 1.85c. On lots from jobbers' stocks, we quote: Tank steel, ¼ inch and heavier, 2c to 2.10c; 3-16, 2.10c to 2.15c; No. 8, 2.15c to 2.20c; No. 10, 2.30c to 2.35c; flange steel, 2.25c to 2.40c, all f. o. b. warehouse.

Structural Steel.—Little of interest has come up and demand has been reduced to a minimum. A considerable number of small orders are picked up by jobbers and structural yards, the material usually going into repairs or small extensions. Official prices are still maintained and we quote mill shipments, Chicago delivery, as follows: Beams and channels, 16 inches and under, 1.75c; 18 inches and over, 1.85c; universal plates, 1.75c; angles, 3x3 and larger, 1.75c; tees, 3x3 and larger, 1.80c; zees, 1.75c. Lots from store, for which there has been a moderate demand, are quoted 2.10c to 2.25c per 100 pounds, rates, cut to length.

Merchant Steel.—While the volume of new business is not very large, specifications come in freely and keep mills busy in all departments. Prices are without change, and we quote Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c; flat sizes, concave and convex, 2.25c; cutter shoe, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.35c to 2.45c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; special, 13c and upwards; less than carload lots, 5 and 10 percent higher; cold rolled shafting, carload lots, 47 percent off; less than carload lots, 42 percent off.

Merchant Pipe.—The leading producer reports that there is an active demand from jobbers for all sizes of pipe, and that the volume of business closed this month compares very favorably with the tonnage of the month preceding. Prices are without change, and we quote to consumers on mill shipments, carload lots, random lengths, f. o. b. Chicago, as follows:

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛ to ⅜ inch inclusive	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches	73.35	63.35	70.35	60.35
7 to 12 inches inclusive	67.35	57.35	64.35	54.35

Less than carload lots, 12½ percent advance over above prices.

Boiler Tubes.—No diminution is to be noted in the demand, country jobbers and consumers sending in specifications freely. The bulk of the business transacted, however, is being closed by the dealers carrying large warehouse stocks, who are shading producer's prices. We quote manufacturers' prices, carload lots, Chicago delivery, as follows:

	L. W. Steel. Percent.	C. C. Iron Percent.
1 to 1½ in.	40.85	37.35
1¾ to 2½ in.	53.85	36.35
2¾ to 5 in.	59.35	49.35
6 to 13 in.	53.85	36.35

Jobbers' prices, for shipment from mills in carload lots:

	L. W. Steel. Percent.	C. C. Iron. Percent.	Seamless Steel. Percent.
1 to 1½ in.	43.35	40.85	53.35
1¾ to 2½ in.	55.85	38.35	40.35
2¾ to 5 in.	60.85	48.35	Up to 4 inches.
6 inches and larger	50.85	38.85	48.35

For car lots or less direct from warehouse stock:

	L. W. Steel. Percent.	C. C. Iron. Percent.	Seamless Steel. Percent.
1 to 1½ in.	40	35	37.50
1¾ to 2½ in.	55.85	35.85	35
2 to 5 in.	60.85	45.85	Up to 4 inches
6 to 13 in.	55.85	35.85	45

Cast Iron Pipe.—On account of the unsettled state of the pig iron market, consumers of pipe are withholding their orders in the hope of eventually buying at lower prices. Sales are restricted to small lots, for which immediate shipment is demanded. We quote carload lots, f. o. b. Chicago, 4-inch pipe, $29; 6-inch and upwards, $28; gas pipe, $1 a ton higher.

Rails and Track Supplies.—It is noteworthy that though the inquiry for standard sections is heavy, and includes some large tonnages, little of it materializes into orders. Specifications continue to be received in good volume however. There has been a good demand for light rails, coal mines being the heaviest buyers. Track supplies have also been more active during the week.

We quote standard sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than car lots, $32; second quality rails, $27; 25-pound rails, $31 to $32; 12-pound rails, $34 to $35, with regular differentials for intermediate sizes. Track supplies, mill shipments: Angle bars, 1.90c to 2c; spikes, first quality, 2c to 2.10c; (out of store, 2.25c to 2.35c rates, carload lots) second quality,

1.80c to 1.90c; track bolts 3½x¾, with square nuts, 2.75c to 2.85c per 100 pounds; with hexagon nuts, 2.90c to 3c, with usual differentials for other sizes.

Wire and Wire Nails.—No change is to be noted in the situation, mills reporting a good demand for all wire products. There has been some falling off in the last few weeks, but this was largely due to the change in seasons and was no greater than expected. We quote to jobbers, Chicago delivery, as follows:

Wire nails, carload lots, $2.15; less than carload lots, $2.20. Cut nails, steel, carload lots, $2.30; less than car load lots, $2.35. Plain wire, $2.05 to $2.10 carloads and $2.15 to $2.20 in small lots; galvanized, carloads, $2.35; smaller lots, $2.40. Painted barbed wire, carloads, $2.45; less than carloads, $2.50; galvanized, carloads, $2.75; less than carloads, $2.80; staples, carloads, $2.30; smaller lots, $2.35; galvanized, carloads, $2.70; small lots, $2.75. Bale ties, 82½ and 5 percent discount f. o. b. Waukegan on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

Coke.—Buying of foundry coke has fallen of to a demand for spot requirements, and in this way a fair tonnage has been booked. Since the sale of 1,500 tons of furnace coke several days ago little interest has been displayed in this grade of fuel. Standard 72-hour Connellsville is now being quoted at $2.65 to $2.90 at the ovens; West Virginia grades $5 to $5.25, Chicago.

Old Material.—There is little or no demand for scrap, and such sales as are made are generally forced at the sacrifice of prices. Both buyers and sellers state that not for months has scrap iron been as low as it is at the present time. The quotations given below are merely nominal, and undoubtedly would have to be shaded at least 50 cents a ton to effect a sale. Railroads are offering material in fair sized lots and disposing of it at whatever prices they can get. Relaying rails alone are in good demand, though prices on these fluctuate from day to day. We quote dealers' selling prices, gross tons, as follows:

Old iron rails	$16 00 to 16 50
Old steel rails (mixed lengths)	12 00 to 12 50
Old steel rails (long lengths)	15 00 to 15 50
Relaying rails	24 00 to 25 00
Old wheels	16 00 to 16 50
Heavy melting steel	12 00 to 12 50
Mixed country steel	10 00 to 10 50

The following are selling prices for net tons:

No. 1 R. R. wrought	$13 00 to 13 50
No. 2 R. R. wrought	12 00 to 12 50
Shafting	13 00 to 13 50
Dealers' forge, No. 1	11 50 to 12 00
No. 1 busheling and wrought pipe	10 00 to 10 50
No. 1 cast	12 50 to 13 00
Heavy cast (300 pounds and over)	10 00 to 10 50
Agricultural malleable	11 50 to 12 00
Iron axles	16 50 to 17 00
Steel axles	14 00 to 14 50
No. 1 boilers, cut	10 00 to 10 50
Cast borings	$ 4 50 to 5 00
Mixed borings, etc.	4 50 to 5 00
Wrought turnings	9 50 to 10 00
Machine-shop turnings	9 50 to 10 00
Iron axle turnings	10 00 to 10 50
Steel axle turnings	9 50 to 10 00
Stove plate and light cast scrap	10 00 to 10 50
Old iron splice bars	14 25 to 15 00

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Oct. 27.

The Pittsburg Steamship Co. is sending its large barges to winter quarters as they arrive at upper lake ports and twenty will be out of commission within a few days. Other companies are curtailing their shipments and it seems certain that the movement of ore for the month will be much below that of October, 1902.

Pig Iron.—While there is little real change in conditions, the prevailing feeling is better and the more optimistic are confident that within a few weeks there will be a buying movement of considerable volume. One favorable indication is the refusal of Northern furnaces, as a rule, to meet the prices of Southern iron, which is now delivered in Cleveland at $14.10, which is equivalent to $10.25, Birmingham. Lower prices on Southern have, however, been made, and for Northern Alabama $10 has been shaded the past week. Five hundred tons of Southern forge were sold at Youngstown at about $8.80 at furnace or $12.75 delivered. Northern sellers are inclined to let foundryman take as much Southern iron as they can use in their mixtures at these prices, believing that they will be compelled to order Northern iron at higher prices to complete their mixtures. The usual quotation for Northern No. 2 is $14.50 at the furnace and there is no evidence of sales at lower prices in this district. There has been a fair tonnage of Northern and Southern iron sold during the past week for early delivery and some inquiry for the first six months. Sellers are not disposed to quote for delivery after Jan. 1, but in some cases sales have been made under agreement that the market price at time of delivery is to be changed. We quote as follows for Cleveland delivery, save on gray forge, which is at Valley furnace:

Bessemer	$16 00 to 16 25
No. 1 Strong Foundry	15 00 to 15 50
No. 2 Strong Foundry	14 50 to 15 00
No. 3 Foundry	14 25 to 14 50
Scotch No. 1	15 00 to 15 50
Scotch No. 2	14 50 to 15 00
Gray Forge, Valley furnace	13 25 to 13 50
Lake Superior charcoal	17 50 to 18 00

Finished Material.—Some jobbers report excellent business out of stock this week and say that their mill sales for the month, while below those of a year ago, will make a very respectable total. Structural material is in small demand, on account of building operations being suspended and owing to bridge companies having large stocks on hand. Bar iron is dull, the usual quotation being 1.40c at the mill. Some efforts have recently been made by buyers to obtain concessions on steel, but, so far as known, these attempts have not been successful and the market remains firm at 1.60c for Bessemer and 1.70c for open-hearth, Pittsburg. An independent interest recently figured on rolling steel bars, but found that, at the prices it would be compelled to pay for billets, it could not turn out the bars so as to compete with agreement prices. Competition in sheets makes prices somewhat uncertain. We quote as follows: Mill sales of black sheets, No. 27, 2.60c to 2.65c; No. 26, 2.55c to 2.50c; No. 24, 2.45c to 2.55c. The following are prices out of stock: No. 10, 2.15c to 2.30c; No. 12, 2.25c to 2.40c; No. 27, 2.85c to 2.95c; No. 28, 2.95c to 3.05c. Galvanized sheets are sold at 75, 10 and 5 off for large lots, desirable specifications, and 75, 10 and 2½ off for smaller lots.

Old Material.—In spite of recent declines in scrap, prices on nearly all kinds of old material are lower this week and we have revised quotations accordingly. We quote the following, gross tons, Cleveland:

Old iron rails	$18 00 to 19 00
Old steel rails (over 6 feet)	13 00 to 14 00
Old steel rails (6 feet and under)	15 00 to 16 00
Old car wheels	16 50 to 17 00
Steel boiler plates	12 00 to 13 00
Malleable iron (railroad)	13 50 to 14 00
Malleable iron (agricultural)	12 00 to 13 00
Heavy steel	12 00 to 13 00

We quote the following net tons:

No. 1 R. R. wrought	$13 00 to 14 00
Mill scrap	11 00 to 12 00
No. 1 machine cast scrap	11 00 to 12 00
Iron axles	18 00 to 19 00
Axle turnings	10 00 to 11 00
Wrought turnings (free from cast)	7 00 to 8 00
Uncut wrought iron boilers	6 00 to 7 00
Grate bars	9 00 to 10 00
Pipes and flues (clean)	9 00 to 10 00
Tank iron	9 00 to 10 00
Hoop and band iron	9 00 to 10 00
Sheet iron	7 00 to 8 00
Wrought drillings	7 00 to 8 00
Stove plate	9 50 to 10 50
Steel axles	16 00 to 17 00
Cast borings	3 75 to 4 00

CINCINNATI.

Oct. 27.

The coke market is quiet and there is an easy tone prevailing. The car situation in the coke fields has been better in the recent past and as deliveries have improved the demand has slackened. The melt of iron is also smaller and this has contributed to lessen the demand for coke. Connellsville foundry coke is quoted at $2.50 to $2.75 f. o. b. ovens.

Pig Iron.—There have been no important developments and trade is dull. There are no large inquiries in the mar-

ket and the sales are still confined to small lots for current needs. The level of prices is lower, based upon a conviction on the part of buyers that on any large orders that might come out a $10 Birmingham quotation would be made; in fact this is so well established that some sellers openly admit that they would quote on this basis. It is stated that on an inquiry for 3,000 tons which was in the market last week this figure was named, but the buyer decided not to purchase at this time. On the general run of small orders that are going $10.25 Birmingham is the ruling price. The $10 quotation covers large lots for prompt shipment. Furnaces are not seeking business for next year's delivery at present prices. Some important furnace interests are declining to follow the market any farther than about the $10.50 basis. Buyers show no disposition to take on any more iron than enough for current wants and the volume of this kind of business has been limited. A sale of 300 tons of gray forge at $9 Birmingham and a sale of 500 tons of the same grade at a figure said to be a shade under $9 Birmingham are about the only other large orders given out, although it is trade talk that a pipe manufacturer took several thousand tons of mixed grades during the week, but the price is not known. The following are the prices current, f. o. b. Cincinnati:

Southern Foundry No. 1	$13 25 to 13 50
Southern Foundry No. 2	12 75 to 13 00
Southern Foundry No. 3	12 25 to 12 50
Southern Foundry No. 4	11 75 to 12 25
Southern Foundry No. 1 soft	13 25 to 13 50
Southern Foundry No. 2 soft	12 75 to 13 00
Gray forge	11 50 to 11 75
Northern Foundry No. 1	16 15 to 16 40
Northern Foundry No. 2	15 65 to 15 90
Northern Silvery (8% silicon)	18 65 to 19 15
Southern car wheel iron	20 75 to 21 25

Finished Material.—The demand has been light and the market is easy in tone. While prices are not quotably lower it is well understood that concessions are obtainable in most lines. Sellers are not forcing or trying to force business and the volume in jobbing orders as well as for larger tonnage has been small. Bar iron is still the most irregular item on the list, with no established price being observed. On carload lots quotations around 1.50c f. o. b. Cincinnati, are made. Steel bars remain at 1.73c base, half extras, with the retail price 1.90c for iron and steel out of store. Galvanized sheets are being quoted at 75 and 10 percent off. We quote black sheets No. 27 at 2.78c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.05c; No. 27, 2.95c; No. 16, 2.55c; No. 14, 2.45c; No. 12, 2.40c; No. 10, 2.30c. Tank plates are firm and sell out of store at 2.05c for ¼-inch and 2.15c for 3-16-inch. Beams and channels are quoted at 2c from stock, and angles at 2c for base sizes. In merchant pipe there is no change to note and the market holds steady at previous prices.

MERCHANT PIPE.
(Basing Discounts.)

	Steel Pipe.		Guaranteed. Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛, ¼, ⅜ inch	66.7	56.7	63.7	53.7
½ inch	68.7	58.7	65.7	55.7
¾ to 6 inch, inclusive	73.7	63.7	70.7	60.7
7 to 12-inch, inclusive	67.7	57.7	64.7	54.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ inch	41.2	37.7
1¼ to 2½ inch	54.2	36.7
2¾ to 5 inch	59.7	46.7
6 to 13 inch	54.2	36.7

Old Material.—The market remains dull at last week's reduced quotations. We quote:

Old No. 1 railroad wrought, net tons	$12 50 to 13 00
Cast machine and foundry, net tons	11 00 to 11 50
Old iron rails, gross tons	18 50 to 19 50
Old steel rails, gross tons	16 00 to 17 00
Old short lengths, gross tons	13 50 to 14 50
Old iron axles, net tons	19 00 to 20 00
Stove plate, net tons	9 00 to 9 50
Wrought turnings, net tons	11 00 to 11 50
Cast borings, net tons	6 00 to 6 50

PHILADELPHIA.

Oct. 27.

General conditions are not improving and the best that can be said is that they are no worse. The demand for finished products does not increase. Orders are so few and small that immediate delivery can be given. Present unsatisfactory conditions as to pig iron promise to continue indefinitely, but the curtailment program now seems to be in a fair way to be carried out as agreed. The range of prices is wide.

Pig Iron.—Pennsylvania brands of No. 2 X foundry are usually held at $15.50 to $16, delivered, but lower than $15.50 has been done. Southern brands are quoted at $14.50 to $15 delivered. The decrease in production in Pennsylvania is estimated at 20 percent. A considerable falling off in consumption during the winter months is expected. Prices are irregular, but about as follows: No. 1 X foundry, $16.50 to $17; No. 2 X foundry, $14.50 to $16.50; No. 2 plain, $14.25 to $15.25; standard gray forge, $13.75 to $14.25; ordinary gray forge, $13.25 to $13.50; basic, $14.25 to $14.50.

Steel.—Extreme dullness prevails. Small lots are taken at $27, but for large tonnage $26.50, or possibly less, would be accepted.

Finished Material.—There is very little business. Mills are running irregularly, none having enough orders to permit full time. Prices are unchanged, as follows: Best refined bar iron, 1.45c to 1.50c; tank plates, steel, 1.75c to 1.80c; angles, 1.75c to 2c; beams, channels for 16 inch and over, 1.75c to 1.90c.

Old Material.—Conditions do not improve and prices are irregular. We quote: Old steel rails, $13.75 to $14.25; miscellaneous heavy steel, $13.50 to $14; low phosphorus scrap, $21 to $23; old steel axles, $16 to $17; old iron axles, $19 to $20; old iron rails, $16.75 to $17.50; old car wheels, $16 to $17; choice R. R. No. 1 wrought, $16 to $17; country scrap, $14 to $15; machinery cast, $14 to $15; No. 2 light scrap, forge, $13 to $14; No. 2 light scrap, ordinary, $10 to $11; axle turnings, $12 to $13; wrought turnings, $10.50 to $11; wrought turnings, choice heavy, $11.50 to $12; cast borings, $6.75 to $7.25; stove plate, $10.50 to $11; wrought iron pipe, $13 to $13.50.

BIRMINGHAM, ALA.

Oct. 27.

The past week has shown more life in the pig iron market than for months past. Immediately on the abolishment of so-called official figures as to market prices, there was a general rush for such business as could be had. The result was some sales of 2 foundry as low as $10, Birmingham basis, though this price was doubtless the extreme limit. Gray forge sold as low as $8.75. However, on the appearance of buyers for good tonnage, at prices ranging from $10.25 to $10.50 for No. 2 foundry, there has been a tendency for values to harden and this week $10.25 is the low figure on ordinary lots, while some prominent buyers are known to have made firm offers of $10.50 for certain brands. Gray forge has probably suffered worse than other grades, the difference between that grade and No. 2 foundry having perceptibly widened. Every furnace company is now making good progress in moving its accumulation, and thus far the railroads have been able fairly well to supply equipment for the business. But the probability now is that with a continued buying movement, the roads will be overtaxed and unable to handle all the iron offered for prompt shipment, particularly during the next sixty days, while the cotton crop is moving. We make the following quotations, f. o. b. Birmingham:

No. 1 foundry	$10 75 to 11 00
No. 2 foundry	10 25 to 10 50
No. 3 foundry	9 75 to 10 00
No. 4 foundry	9 25 to 9 50
Gray forge	9 00
Alabama car wheel iron, all grades	17 00 to 18 00

There is further talk of taking up the export trade by the Southern makers, as Alabama iron was well established in 1898 and 1899 in certain foreign markets. The railroads have secured and quote as low a rate as $3 on this business, and with better movement of cotton, it is expected this will be reduced to $2.50. In event such a rate is made, it is confidently believed that the leading interests here would make every endeavor to land as much as 5,000 tons on the other side.

Coke has shown some decline, in sympathy with the iron market, though the price yet remains above $3 Birmingham,

while coal is available at $1.20 to $1.40 for the standard grades of run-of-mine. The miners, as heretofore stated, are working at a reduction of 5 cents per ton for cutting coal this month, which makes a reduction of about 7 cents per ton in the cost of coal at the mouth of the mine; and with present prices of iron it is anticipated that there may be a further reduction of 2½ cents per ton for November, or say 4 cents in the cost of the coal on the cars.

BIRMINGHAM, Ala., Oct. 27.—The Alabama Steel & Wire Co. announces that it expects to have its new furnace stack at Gadsden ready to make pig iron by Dec. 1 or 15. The Lookout Mountain Iron Co. has begun drying out a battery of 100 coke ovens at Battelle, Ala., where it is now erecting a modern furnace plant. The company has contracted for a total of 300 ovens, all to be completed by March 1, 1904. It is expected that iron can be produced at that point by July 1, 1904.

At a meeting of the creditors of the Southern Car & Foundry Co., held in Chattanooga, Monday, Oct. 26, it was voted that T. G. Bush and T. A. Gillespie as receivers continue the operation of the different plants, if thought expedient. All the four plants of the bankrupt concern are now in operation, the one at Memphis working on a contract for Illinois Central cars and the one at Anniston completing an order for Santa Fe cars. At Gadsden and Lenoir more or less repair work is being done for local roads.

The Lacey-Buek Iron Co.'s furnace at Trussville has been put in operation again, after having been idle for three and one-half months. A skip hoist, with patent filling device has been installed, while additional boiler and blowing power has been added. Forty new coke ovens have been built. The furnace has been overhauled with a view of producing 200 tons daily.

The American Castings Co., recently organized by local and Eastern parties, has secured a location at East Birmingham and begun the erection of its proposed foundry.

A WHEELING DISTRICT CONSOLIDATION.

A consolidation of the Wheeling Corrugating Co. and the Whitaker Iron Co., of Wheeling, W. Va., Laughlin Nail Co., of Martins Ferry, O., and the Portsmouth Steel Co., of Portsmouth, O., has been practically effected. All the interests in the consolidation have been closely allied for some time, the Laughlin Nail Co. and the Whitaker Iron Co. having shared the ownership of the Portsmouth Steel Co., while the Whitaker Iron Co. is the owner of nearly all of the stock of the Wheeling Corrugating Co. The new company is to be conservatively capitalized and headquarters will be established at Wheeling. An organization has not yet been effected nor has a charter been applied for. The name of the new concern will be the Whitaker-Glessner Co.

The Whitaker Iron Co. operates five 22-inch sheet mills, one 22 and two 24-inch black plate mills and five 22-inch cold mills, as well as five double puddling furnaces and a bar mill. The Wheeling Corrugating Co. produces corrugated sheets and does all kinds of stamping, and in addition operates nine sets for either tin or terne plates, having a weekly capacity of 4,000 boxes. The Whitaker Iron Co., which furnishes the sheets and black plate, has an output of 20,000 tons per year. N. E. Whitaker is president of the Wheeling Corrugating Co. and Alex. Glass secretary, while the president of the Whitaker Iron Co. is N. E. Whitaker and the secretary A. C. Whitaker.

The Laughlin Nail Co., of Martins Ferry, O., operates 225 cut nail machines and has one train of plate rolls. Its output of nails is 625,000 kegs annually. In addition the plant contains four hot and four cold mills, with an annual capacity of 12,000 tons. In connection with this plant a shovel works is operated, producing 100,000 dozen shovels a year. W. L. Glessner is president of this company and F. K. Dixon secretary.

The plant of the Portsmouth Steel Co., Portsmouth, O., which is owned jointly by the Laughlin Nail Co. and the Whitaker Iron Co., supplies these concerns with steel and occasionally has a small tonnage to offer in the open market. This plant was formerly owned and operated by the Crucible Steel Co. of America. It contains four 30-ton open-hearth furnaces, with an output of 60,000 tons annually. The rolling mill contains four bar mills and two plate mills.

ECONOMIES OF INTERNATIONAL HARVESTER CO.

The International Harvester Co. announces that its general offices will hereafter be located in the Powers Building, 7 Monroe St., Chicago. In accordance with the plans of economy and centralization outlined at the time of the merger, but which circumstances have prevented being put into effect until quite recently, the offices formerly maintained at the various plants of the constituent companies have been abandoned and the auditing, purchasing, manufacturing and selling departments will be concentrated at the new location. The old offices will be continued in a restricted form as factory offices. A change has also been made in the methods of selling which will affect a large number of employes. Under the old system, each of the divisions in the various territories had its own organization, from general agent down, but hereafter, one general agent and organization will handle the product of the five divisions in the district pertaining to that agency. In the country towns and communities, however, separate local agents will be retained for the Champion, Deering, McCormick, Milwaukee and Plano machines, and canvassers will be furnished to these agents for each machine as heretofore.

C. S. Funk, manager of the security department, stated to a representative of *The Iron Trade Review* that, besides affecting needed economies, the new arrangemnt will be more satisfactory to the local agents. Also, bacause of the increase in the number of machines handled by each general agent, the territories have been redivided and reduced. These changes the company is not yet ready to announce. Mr. Funk also stated that in line with the new policy, the best methods of manufacturing at each plant will be adopted and installed at the others, and hereafter one purchasing agent will buy for all the works and one traffic manager arrange all transportation matters, etc. The different departments and their new managers, whose headquarters will be at 7 Monroe St., are as follows: Sales Department—A. E. Mayer, general manager; R. C. Haskins, manager domestic sales; C. H. Haney, manager foreign sales; H. L. Daniels, manager fiber department. Manufacturing Department—E. A. S. Clarke, general manager. Collection Department—C. F. Steele, general manager. Purchasing Department—H. F. Perkins, general manager. Patent Department—J. F. Steward, general manager. Traffic Department—O. W. Jones, general manager. Experimental Department—R. B. Swift, general manager. Security Department—C. S. Funk, general manager.

In spite of rumors to the contrary, officials of the Zenith Furnace Co., Dultuth, Minn., state that they expect to operate the plant this winter. Coal and limestone have not yet been received, but it is expected that they will be delivered during November. It is expected that th stack will be relined within a month or two, and that operations will then be resumed.

Weil Mfg. Co., Chicago, has been incorporated with a capital stock of $100,000 to manufacture steel and iron castings. The incorporators are Arthur Weil, Adolph Schneider and Simon Young.

Chicago Knife Works, Chicago, has been incorporated with a capital stock of $5,000 to manufacture knives and machines. The incorporators are M. Doherty, Edward P. Fick and Gertrude Foster.

The Palmetto Metal Co., Chicago, has been incorporated with a capital stock of $25,000. William E. Askley, Joseph W. Latimer and William K. Rapp are the incorporators.

The foundry of the Shunk Plow Co., Bucyrus, O., is practically completed and the old machinery will be moved into the new shop at once.

The foundry of the Interstate Drainage Co., of Algona, Ia., was recently destroyed by fire. Loss, $4,000. The plant will be rebuilt.

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OCTOBER 29, 1903

THE JOBBER'S CLAIM TO RECOGNITION.

It is not far from two years ago that we pointed out that after several years of existence the "trusts" in certain iron and steel products had not forced the jobber out of business, as it had been predicted they would. Since that time developments have been still more in the direction of strengthening the position of the jobber.

It does not follow that the position of the jobber has not changed in these years. It has changed in a very material way. There is an old precept in trade, to the effect that if goods are bought right, they will sell themselves. In many lines this precept is being relegated to the background, and it may be replaced by a more modern one, that goods sold right will buy themselves.

Nothing can be more logical or sound than this change. It was not a stable condition of trade, where the strength of the jobber lay in his ability to beat down the manufacturer's price and get goods at a little lower price than his competitor had to pay. If good buying made the jobber, then his title to a profit rested on no more secure foundation than this ability. In turn, his ability to sell rested merely on his ability to buy.

As matters have been shaping themselves in the past five years, it is the jobber's ability to sell, or to put it more broadly, to distribute, which gives him title to a profit. Here his title is good, because it is reducible to dollars and cents. By a proper organization, he can distribute various goods at a certain cost. If this is lower, from various reasons, than that which the manufacturer would incur in distributing his own products only, then the jobber occupies a logical place in the economy of trade. In certain lines of iron and steel product the jobber can do the distributing work at less cost than could the manufacturer. This has been shown in a line showing such small margins as wire nails.

In the new order of things, which places ability to sell beyond ability to buy, the jobber has a wider and more pleasant field for true business skill. He can keep in touch with his trade, and with his men on the road, by modern appliances which but a comparatively few years ago were of much narrower application. The perfect office paraphernalia now available permits him to classify and arrange his possible customers, keeping track of each case with a minimum of expense, which falls but very lightly on his total volume of business.

There is a growing disposition on the part of jobbers to recognize that the work of the "trusts" in thus molding the character of their business, has not been altogether an evil. When another field for activity opened up, it was not without some satisfaction that the jobber laid aside his old task of trying to get around the manufacturers' agreements, which used to be the great problem, and is still in some lines. A change which the jobber has been less inclined to welcome is the lessened ease with which he can get goods he handles branded with his own mark. Yet we could cite a line in which the refusal of one "trust" to make jobbers' brands has been a benefit to the trade. It is a case where the product comes in competition with entirely different goods, used for the same purpose. There are "independents" outside of the trust, and these independents will brand the product as of any grade the jobber elects, wholly irrespective of the real quality. This the "trust" refuses to do, and by its action is helping to place this line of manufacture on a much better basis, increasing the confidence of the public and encouraging heavier consumption. Ultimately the jobber will recognize the economic value of this principle of honesty.

A BRITISH VIEW OF THE "DUMPING" PROCESS.

The tariff controversy is on with spirit in the British press, and the iron trade naturally comes in for a large share of attention. The probability that iron and steel exports from the United States are to be reckoned with in the near future, in addition to the steady influx of German products which has been a marked factor in the past year, has brought out some strong expressions in favor of such a tariff adjustment as would prevent the "dumping" of cheap German and American steel. The need of cheap food for the shop and factory population of Great Britain is as well recognized as in the days of the repeal of the anti-corn laws, but those who have been won to Mr. Chamberlain's position find in the world-changes in industry an argument for protection to the manufacturer and his employes that did not exist in the times of Cobden and Bright. As illustrating the other view, the following from a correspondent of the London *Standard* is interesting:

The so-called "dumping" has been an unmixed blessing to many branches of industry, and the term itself is quite misleading, for the metal concerned was not thrust upon people unwilling to receive it, but was purchased by manufacturers thankful to be able to avail themselves of supplies of cheap foreign raw material for conversion into completed manufactures. "Dumped" material, in fact, is material which has enabled us to do more than hold our own in certain markets against even our strongest commercial rivals. Many of our shipbuilders, for instance, have purchased large lots of German shipplates, which have been worked up in British yards by British labor into British ships, to say nothing of the vessels so constructed

for foreign owners. * * * Again, take the galvanized sheet trade. Galvanized sheets are steel sheets coated with zinc or spelter, spelter being zinc in ingot form. Nobody complains that spelter is "dumped" here, although it is almost exclusively a Belgian and German product. What would be the result of a duty being placed upon spelter and steel? It would certainly ruin our galvanized sheet trade. Practically all the sheets made here are coated with foreign spelter, and a considerable proportion of the steel used has lately been of foreign manufacture. It is a little difficult to see why, if imported foreign iron and steel are to be taxed, there should not be a duty put upon foreign ore. Would this suit the Cleveland iron masters and the West Coast steel makers? What is the difference between "dumping" iron ore into the country and "dumping" foreign pig iron and half-finished steel? And this opens up the interesting question regarding the position of some of the colonies. Canada, for instance, puts on a duty against imported iron and steel—and at the same time she pays a large bonus upon all pig iron and steel produced in the colony. By the aid of these bounties and the protective tariff, a good deal of iron and steel has been exported from Canada, originally to Great Britain, later on, under the growth of the United States demands, to that country. What should be the position of protected and bounty-fed colonial iron "dumped" here in relation to protected iron "dumped" from, say, the Southern States of the United States, Belgium, or Sweden? It would, surely, be hard to distinguish between the two, and unfair to make fish of the one and flesh of the other.

If such a view of the case satisfies British steel manufacturers there should be no complaint on the part of their competitors in the United States. But it is evident that the protection idea has not very seriously inoculated the thinking of our British cousins. The protective tariff of the United States was never built on any such flimsy foundation. Carry the argument a little further and we shall have the British manufacturer congratulating himself on the splendid proportions of his import trade in iron and steel. If the American and German manufacturer can so easily lodge pig iron and semi-finished steel at British works, on what basis is it assumed that they will not also make large shipments of rolled steel, seeing that in rails, plates and structural shapes labor is a relatively small factor with the enormous tonnages of a modern mill?

It needs to be remembered that the particular species of lack of confidence that is now so strongly influential in the iron market is lack of confidence in the continuance of the prosperity level of prices. In 1893 there was lack of confidence in banks; in the ability of the United States Government to maintain the integrity of its currency while subjecting it each month to so large a dilution of half price silver dollars; in the loose credit methods that had been creeping into an over-extended manufacturing business,—and chiefly in the maintenance of industrial prosperity under the reduced tariff which the Congress and President elected in 1892 had promised to give the country. Not one of the prime factors in the collapse of 1893 and the long train of troubles that followed, is present today. There is a pronounced halt in business; but it is largely for the purpose of taking a survey of the situation and making sure of the future. Buyers have had a habit for three years of contracting far ahead. That there has been a change in this respect accounts for the 25 percent reduction in the amount of unfilled orders on the steel corporation's books, of which so much was made in some financial reviews recently. Without attempting to make any forecast we simply call attention to the fact that following a long period of well sustained prices the unwillingness of consumers to commit themselves far ahead at prices above the average for a term of years, is not to be construed as a calamitous indication. The popular belief in periodic swings in prices is enough to account for such a halt as the present one.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*.
ROOM 1909, NO. 150 NASSAU ST., Oct. 27.

Pig Tin.—Prices at this writing show an improvement of over 1 cent since our last report, owing to the action of speculative interests in London boosting prices considerably in that market, which were followed by an upward movement here in sympathy. The advances have been pretty well maintained, and present quotations for futures indicate that they are likely to be for a little while anyway. Closing prices at the Metal Exchange today were as follows: Spot, 26¼c to 26½c; October, 26c, and November 26c. London closed today as follows: Spot, £117 10s; futures, £117 17s 6d. Arrivals at Atlantic ports for the month to date amount to 3,390 tons, with 1,035 tons afloat.

Copper.—As compared with our last quotations, the "official" prices have all been advanced to the extent of ⅞c in Lake, and ¾c in electrolytic and casting. The improvement in the market was caused by the announcement that the Amalgamated company had closed its mines in Montana, thus restricting the output by about 10,000 tons monthly. An adverse court decision is given as the reason for the company's action, but this is only looked upon as a pretext, as the trade situation is said to be very bad by those directly connected with it, and really made the company's action imperative. Prices in the open market are at least ¼c lower, and buyers are holding off, either because they are already well supplied, or believe lower prices inevitable. The London market has been very strong, advancing over £3 in both spot and futures yesterday, although prices receded today. Closing prices at the Metal Exchange today were as follows: Lake, 14c; electrolytic, 13¾c; casting, 13½c. London closed today as follows: Spot, £59; futures, £58 12s 6d. Exports for the month to date aggregate 8,760 tons, against 9,580 tons for a similar period last year.

Lead.—Spot is unchanged at 4.50c. St. Louis is slightly weaker at 4.27½c, London is a shade higher at £11 6s 3d.

Spelter.—Spot is scarce and strong at 6½c. Nov. is quoted at 5.55c. St. Louis a little stronger at 5.50c. London is higher at £20 15s.

Antimony.—Cookson's is 7¼c, Hallett's 6¼c, and outside brands 5¾c.

Quicksilver.—Is quoted at $47 per flask of 67½ pounds in lots of 100 flasks. London is £8 7s 6d.

Nickel.—Is selling at 40c to 47c for large lots down to a ton, and 50c and 60c for smaller quantities.

CHICAGO.

OFFICE OF *The Iron Trade Review*.
1115 MONADNOCK BLOCK, Oct 27.

As a result of the shut-down of the Montana copper mines, the demand for copper has brightened and prices have advanced one cent a pound. The advance was made without any warning to the trade, the notices being sent out on Saturday afternoon with the statement that the new schedule of prices would be effective Monday morning. Many have since covered for their season's requirements, fearing a prolongation of the shut-down and an ensuing scarcity of material. Other metals are without material change. Prices continue along the same level, though fluctuating fractions of a cent from day to day. We quote Lake copper, carload lots, 14c to 14¼c; casting, 13⅞c to 14c. Pig tin, carloads, 26¼c; lesser lots, 26¾c. Pig lead, 4.40c in 50 to 100-lots, and 4½c to 4¾c in small quantities. Spelter, 5.60c in carload lots, and 6c in small quantities; sheet zinc, 6¼c; antimony, 7½c to 8c for both Cookson's and Hallett's.

Old metals, generally speaking, are weak and sluggish in sympathy with other forms of scrap, and prices are of a declining nature. Copper has improved as a result of the Montana episode and prices have stiffened. We quote dealers' selling prices as follows: Copper wire, $11.50; copper, heavy, $11.25; light copper, $10.50; red brass, $10; red brass turnings, $8.50; yellow brass, $7.50; yellow brass turnings, $6.50; lead, $3.90; zinc, $4.25; pewter, $17.

The Labor Situation.

A LARGE COAL OPERATOR ON CONCILIATION.

F. L. Robbins, of Pittsburg, was one of those who sounded a note of optimism at the recent Chicago meeting of the National Civic Federation. As one of the largest employers of labor in the United States and one who meets his employes face to face at the conference table to settle the scale, Mr. Robbins is competent to speak on the conciliation phases of the problem. John Mitchell, at the conclusion of Mr. Robbins' remarks, said: "If all employers treated with their employes as Mr. Robbins does there would be no occasion for such an organization as the National Civic Federation." In addition to his large coal interests, Mr. Robbins has railroad, dock, steamship and car shop connections—corporations employing over 75,000 men—and thus has had a wide and varied experience in the handling of labor questions. We give his address below as a type of conservative, philosophic utterance and as such entitled to consideration. The difficulty is that while men on both sides can subscribe to such general statements, a concrete example of the divergent interests of employer and employe tests their patience and their tolerance beyond the limit. We are aware that employers are in no kindly mood toward certain of the labor unions at this time, and conciliation talk does not find the response that was given it two and three years ago before union excesses and crimes were not so large a part of the current thinking about organized labor. Nevertheless we cannot but believe that, in spite of the temporary set-backs to conciliation—and it is having one of these now—all real progress in the working out of the employer and employe problem is to be by this route. Mr. Robbins said:

"The great problem of today, and upon its solution depends the future, is how to best harmonize Capital and Labor through the relations existing between the employer and the employed. That they can and should be harmonized is self-evident, for their interests are reciprocal and the necessity is apparent. I believe in organization for both Capital and Labor.

"Combinations, where values are equal to capitalization, their acts open to government inspection, their results made public by published yearly statements, managed by fair minded, conservative men, are of benefit to their employes and to the public at large.

"Labor unions founded upon right principles, under the leadership of honest, conservative officers, are necessary for the protection of the employes, and often an aid to the employer who is willing to pay just wages and establish fair conditions but is hampered by competition with the employer who is unwilling to do so.

"You will notice I regard as a requisite to success fair minded, conservative men as leaders for each side. The feeling of distrust in many minds can only be wiped out by respect and confidence established through fair treatment. Human nature is the same, whether in the employer or the employe. Each is too prone to confine himself to his own view point. To reach amicable settlements, leaders must look at questions from each other's standpoints, as well as their own. Responsibility tends toward conservatism, and I have never known a successful labor leader who did not become more conservative as his experience and responsibilities increased.

"As to the methods of making trade agreements, probably the most conspicuous example, affecting the greatest number of people, is the Interstate meeting of Bituminous Operators and Miners held annually in Indianapolis to establish rates of wages and conditions of labor. It is not perfect by any means, but it has accomplished much good and has served as an object lesson for the whole country. It has brought into contact the mine owners and the miners' representative leaders. That in itself has been of great benefit.

"Too often employers trust the establishing of wages entirely to subordinates whose recommendations are accepted without personal investigation. I hold it to be the duty of employers to become personally familiar with trade conditions, and not delegate to others their responsibilities in the matter of establishing wages and conditions under which the labor is performed. This Interstate meeting has furnished a medium where through debate, personal contact and discussion, the employer and employes exhange views and each becomes familiar with the other's point of view. Those of us who have been associated with that movement for years can bear testimony to the improvement in the personnel of the miners' representatives. Each succeeding year we meet a more intelligent body, and the majority are anxious to make a peaceable and equitable agreement.

"It has been the means of developing many able labor leaders, a conspicuous example being Mr. Mitchell, and there is nothing more important than the building up of men of whom he is a type—honest, fearless, loyal to the interests of labor; but experience and reason teach them that labor's best interests lie in harmonious relations with capital, and that they must control, direct and guide their less intelligent fellow men into such relationship wherever it is possible. Experience has shown us that a wage agreement is regarded by the miners as binding and must be observed during the term of contract. It would be well for all labor organizations to emulate this good example. I believe compulsory arbitration to be impracticable, and that it would be unsatisfactory in its results.

"I am, however, in favor of compulsory education, and I would make patriotism the keystone. I would teach honor, respect, pride and reverence for the flag, and that it floats over the greatest nation on the earth and represents the grandest form of government; that the right of American citizenship which makes the capitalist and laborer equal places upon each the same obligation to respect, maintain and support the law of the land; that he who has acquired property is not a socialist; that the right of citizenship is as great a treasure and that he who has it is a partner in a government which respects and protects the rights and liberty of each citizen, and that the humblest born may fill the highest position in the land.

"This is the duty we owe to coming generations, but the duties of the present are upon us also. Let us do our duty as citizens by filling the executive offices of the government, our legislative bodies and the courts with our ablest and most patriotic men, and then give them our hearty support. Let us criticise less and praise more. A patriot cannot be an oppressor, whether he be a capitalist or a laborer. In the winding up of our Interstate meetings, we have been accustomed to sing 'America.' Let us all try to live up to it, and we will have helped to solve the problem."

STAGNATION CAUSED BY STRIKES.

The annual convention of representatives of the Harrisburg Foundry & Machine Works was held Oct. 15 and 16 at Harrisburg, Pa. The principal matters under discussion were reports from the company's traveling representatives in the way of suggestions as to improvements in the building of its machinery. A general discussion was invited, and notes made of the suggestioins for the improvement of product. In the general discussion regarding the business situation, it developed that in some parts of the country there seemed to be no let-up in the general activity which has been prevailing for such a long time, but in other sections there is a complete stagnation and hold-up, due altogether to labor troubles. A good part of the company's product is used in the large buildings on which work has been stopped almost entirely by the strike of the structural steel workers, and many projects that were contemplated have been abandoned, so that the steam engines which would have been installed in those buildings have not been contracted for. In the out-lying districts, work on power plants for street railways, etc., this handicap has not been felt so much, but it really has become a serious matter in the large cities, affecting transactions that were prospective as well as those about to be closed, and in fact many orders

which the company received for machinery have been held up for the reasons above given.

MACHINISTS TOLD TO SETTLE STRIKES.

The strike of machinists at the East Pittsburg plant of the Westinghouse Machine Co., East Pittsburg, Pa., has been declared off by the International Association of Machinists. The men are at liberty to return to work under the conditions prevailing before the strike was declared. In this contest the machinists were defeated as they made every effort to compel the Westinghouse interests to recognize organized labor, which they have never done in the past.

Business agents, organizers and executive officers of the various locals of the International Association have received a communication from President James O'Connell, urging the settlement of all troubles on the best terms possible. The circular is in part as follows: "Wage reductions are threatened in various quarters and prospects are not particularly bright for employment during the winter months. While the machine shops of the country, according to the latest reports, have a good supply of orders on the books, there is an uncertainty and members are advised to arrange all differences by arbitration."

MACHINISTS' UNION SEEKS CONFERENCE.

It is understood that overtures were made recently by President James O'Connell, of the International Association of Machinists, for a meeting between officers of the union and representatives of the National Metal Trades Association, with a view to securing a national agreement. The history of the New York agreement of 1900 between the two organizations is well known, as is the refusal of the machinists' union later to be bound by it, and the publication of a garbled version of the agreement for circulation among the machinists, their officers apparently fearing to have them know that the New York agreement sanctioned the "open shop." President O'Connell's attempt to renew negotiations with the National Metal Trades Association is for the purpose of arranging a national agreement. The administrative council of the National Metal Trades Association is reported to have decided unanimously against the renewal of relations with the machinists' union in the way proposed. The letter of Commissioner DuBrul in reply to President O'Connell's communication is as follows:

"I am directed to inform you that in view of the position promulgated by your association at its last general convention against the open shop and the right of the individual to work where he pleases; against the freedom of every American boy to learn a trade, by arbitrarily limiting the number of apprentices; against just methods of increasing production and freedom of shop management, that the meeting you propose is considered inadvisable."

LABOR NOTES.

At Cincinnati the excutive board of the Iron Molders' Union elected the following officers last week: Lawrence O'Keefe, Detroit, fourth vice president; Valentine Barry, Pittsburg, and George Gunnery, Indianapolis, additional members of the national executive board. President Joseph Valentine, John Frey, John Bradley and Martin Murphy were elected to the annual convention of the American Federation of Labor, to be held in Boston next month.

A committee of business men of Granite City, Mo., has acted as an intermediary between the grievance committee of the Chippers' Union of Granite City and the management of the American Steel Foundries. A settlement was effected, both union and company making concessions.

The merchants of Birmingham, Ala., have formed an organization known as the Citizens' Alliance to deal with their employes. The anti-boycott law recently passed by the Alabama Legislature, has had good effect, and the Citizens' Alliance has been able to prevent strikes and to establish more friendly relations between employer and employe than have existed for a long time.

The strike of puddlers and finishers at the Frankstown plant of the National Tube Co., Pittsburg, declared by the Amalgamated Association of Iron, Steel & Tin Plate Workers, continues. The men claim a victory, but it is doubtful whether the plant will be operated again under the jurisdiction of the Amalgamated Association.

The plate mill scales of the Republic Iron & Steel Co. and the Tennessee Coal, Iron & Railroad Co., applicable only to their respective Birmingham, Ala., plants, were amicably adjusted last week with the Amalgamated Association of Iron, Steel and Tin Plate Workers. Both mills had been idle since last July and resumed operations this week.

The molders employed at the Morris Foundry & Machine Co.'s plant, Ottawa, Ill., have gone on a strike to enforce a demand that work on castings being done for other foundries in which strikes were on should be discontinued.

Several hundred employes of the American Car & Foundry Co., at New Albany, Ind., who struck seven weeks ago, and have lost $60,000 in wages, returned to work Oct. 22. Both sides made concessions and the men got a slight increase in wages.

The knife making department of the Jackson Knife & Shear Co.'s plant, Fremont, O., has been closed for an indefinite time, as the manager says the concern cannot pay the increased wages asked for by the men and still compete.

A suit for $20,000 has been brought by Rand, McNally & Co., Chicago, against Franklin Union No. 4, an organization of press feeders. The men have been picketing the printing house and, it is charged, have caused a heavy loss through their interference. The company now seeks to recoup from the treasury of the union. The officers of the union are made separate defendants. The petition alleges a conspiracy to ruin the business of Rand, McNally & Co. through boycotts, intimidation, and malicious mischief. It will be declared that the methods of the union are in restraint of trade and that it, being an incorporated body, is responsible in the courts for its actions.

Armor Plate Contract for Midvale Steel Co.

Secretary Moody has decided to divide the contract for furnishing the 16,000 tons of armor plate for the five new battleships authorized by the last Congress between the Midvale Steel Co. and the Carnegie and Bethlehem companies. By contracts the Midvale company is to furnish 6,000 tons of armor for the two 13,000-ton battleships, the Idaho and Mississippi. The Carnegie and Bethlehem companies are awarded the contract for furnishing the 10,000 tons for the three 16,000-ton ships, the Vermont, Kansas and Minnesota. The secretary's determination to divide the contract was made after the visit of Admiral O'Neil to the plant of the Midvale Steel Co. last week. Admiral O'Neil reproted to Secretary Moody that although the company did not have any armor plant at present, the officials had convinced him that one could be built in time to begin deliveries of armor plate within 20 months after the contract was signed. Although Admiral O'Neil was not informed by what process the Midvale company intended to manufacture armor, he was given assurances that the plate would meet all the requirements of the department and would withstand any test.

The two blast furnaces of the Lorain Steel Co. at Lorain, O., were blown out last week. Both will be relined and will not be started until after Jan. 1. It is announced also that the steel works will be shut down and some of the departments are already idle. In recent months the company has had 3,200 men on its pay roll. The repair work and the erection of the new plant of the National Tube Co. will give employment to a considerable number.

The Rotary Engine & Tool Mfg. Co., Ashtabula, O., capital $50,000, has been incorporated by S. M. Wade, Geo. H. Platt, G. E. Garner, F. A. Butler and H. D. Carpenter.

For the first time in 70 years the Hurd iron mine at Wharton, N. J., was shut down a few days ago, and there is no indication of an early resumption.

The Kingman Plow Co., Peoria, Ill., has increased its capital stock from $400,000 to $600,000.

LAKE SUPERIOR IRON MINES.

Corrigan, McKinney & Co.'s Mesabi range shipments for the year have ceased at Jordan and Commodore mines and will cease at Stevenson in two weeks. Jordan has produced 190,024 tons, of which 11,234 went by rail; Commodore has shipped 20,436 tons. Stevenson will ship better than 1,000,000 tons. Production at all these mines will be much less than was anticipated earlier in the year. At Jordan they will be moving all winter, preparing for milling another season. At Commodore they have six drills testing the ore measures, and with a view to possible change in the method of mining which is now by the underground process. A large amount of development will be conducted at Stevenson during the late fall and early spring with a view to widening and increasing the stripped ore area.

Mr. Hodge, who has been with E. J. Longyear, at Hibbing, Minn., for more than two years, has, with Mr. Longyear, taken a contract for drilling for the Flewelling Development Co. at North Freedom, Baraboo district, and they have put one drill at work. Several other developments in that section, that has not been explored by drill, are to receive attention at once.

The Winnifred Iron Mining Co. has ceased shipments at its Laura and Winnifred mines. Both mines are underground and both are in section 31-28-20. They ship over the Great Northern road. Shipment from Winnifred for the season, 29,000 tons; from Laura, 87,000.

Experiments with the washing plant of the Standard Mining Co. at the Arcturus mine have ceased and the mine is idle. It was an experimental operation, washing ore that had been in stockpile in order to test the possibility of freeing it from sand, and is understood to have been quite successful. The property was examined by several mining engineers of the Oliver Iron Mining Co. and then shut down. The Standard Mining Co. is a W. P. Snyder interest.

Kanawha mine, of the Colonial Mining Co., a Drake, Bartow & Co. interest, has been closed permanently, the ore measure being exhausted. It was a small deposit of non-Bessemer ore.

Pearce and Croxton mines, both managed by Jos. Sellwood, of Duluth, will close about Nov. 1, the former with a season shipment of 50,000 tons, the latter with 110,000. Pearce is underground; Croxton is a milling property.

At Troy mine of Pickands, Mather & Co., they have commenced stockpiling and will be active all winter. It is intended to make this mine quite a shipper another year.

Clairton Steel Co., whose Champion mine, Marquette range, was closed last week, proposes to curtail operations at its Mesabi properties, and the cessation of Arcturus experiments is along that line. Shenango mine will not be closed but may be reduced in force. This has been a very costly mine to open and has met numerous unlooked for difficulties. Operations the company had in mind for the near future west of Hibbing may not be undertaken for some little time. At Champion there is in stock about 270,000 tons of ore, a hard specular, of which Clairton furnaces consume no great quantity yearly. The mine is abundantly developed ahead and can mine 300,000 tons per annum for the next ten years, with what exploration and development has now been done. In point of fact the mine shows more ore than at any time in its history.

Dickinson county, Mich., in which is the Iron Mountain group of mines, showed 4,004 men in mines the past year, with 16 fatal accidents. Iron county, in which is the Crystal Falls group, showed 1,678 men with 19 fatal accidents.

Explorations on the old Lackawanna Iron Co. property,

The Great Northern road, which has been exploring in townships 56, 23 and 24, Minnesota, has stopped work. G. G. Hartley and associates are still working near the Holman property in T 56 R 24. Fletcher Bros., of Minneapolis, who have been working for some time in that vicinity, are through, having proved up their property. Several drills are working near a lake in sections 14 and 23 T 56 R 24. Aside from these and the Hartley operations, not much is under way on the extreme westerly end of the Mesabi range in Itasca county. Most of those new people who went in from Grand Rapids, Minn., and from Minneapolis last year in the hope of making a rich strike suddenly have pulled out without getting any results.

in section 23 T 57 R 22, Mesabi range, have ceased. Some ore of fairly good grade was shown under a considerable thickness of rock. Drilling was quite expensive and very slow.

The Minnesota Iron Co. (U. S. Steel) has closed an option taken some time ago for a state lease in the northwest part of section 36 T 59 R 18. This is three miles northeast from the Mountain Iron mine and is the first ore found so far north as R 59 until east of the range line between ranges 15 and 16. The find contains about 3,000,000 tons of 50 percent ore and carries a 25-cent lease. The ore is of good structure and the mine will be an underground property. It probably will not beopened for some time. L. Rouchleau, of Duluth, was the original holder and optioned the property to the Minnesota Iron Co. for $40,000 after several explorations had resulted unsuccessfully.

The White Iron Lake Iron Co., composed of a number of tradesmen of Duluth, is operating a diamond drill in section 2 T 62 R 12, Vermillion range, and is reported to be in the jasper formation. Adjoining their lands are magnetic outcroppings that are claimed to be of good ore. This property is a few miles south of Ely.

A reduction of force is to take place at all the mines of Ely excepting the Chandler. The night crews will be withdrawn from the Pioneer, Zenith, Savoy and Sibley and some construction work that has been in progress for a considerable period will be suspended for the winter. These mines will not clean up their stocked ore during this season of navigation, which accounts for the curtailment, but it is expected that operations will resume in full soon after the new year.

Pickands, Mather & Co. have closed their Sparta mine near Eveleth, and will mine no more ore there this year. Their Elba is producing about 200,000 tons this year, a material reduction from the season before. Their Troy, a new mine, not entered until during last fall, is to make a production for this season of about 30,000 tons, practically all of which has been in the way of development. The main shaft is down 140 feet and drifting of 800 linear feet has been done in the ore. There is 90 feet of surface where the shaft was sunk, and this was covered by a heavy quicksand, which bothered the operators considerably. Stockpile ground has been leveled off and a trestle is built, so that operations may be continued all winter.

All the Mesabi range mines of the Republic Iron & Steel Co. are to reduce forces for the winter. Their Kinney mine, being a steam shovel property, is to close completely in a few days. At this mine, where the Wallace Contracting Co. commenced work of preparing for stripping the overburden less than two years ago, they are soon to complete their stripping contract for 2,000,000 yards. Two large shovels have been in the stripping continuously and a very large area has been stripped. The overburden is from 40 to 45 feet in thickness.

Curtailments of output and force employed are to take place at several more important old range mines very soon. These include the discharge of about 200 unmarried men from each, the Chapin and Aragon, Menominee range, the two leading properties of the U. S. Steel Corporation on that range. The two mines have been employing about 2,000 men between them.

The various Corrigan mines at Crystal Falls and vicinity are to reduce at once, and Great Western, Armenia and Lamont will close entirely and will be permitted to fill with water. Great Western's big pit is to be filled with waste, to prevent the washing of sand into the ore below. Crystal Falls and Tobin, of the same ownership, will be maintained active

for the winter, it is now presumed, and these and Bristol are the only mines at Crystal Falls village that will do anything.

The Consumers Ore Co. (M. A. Hanna & Co.) is sinking its first Mesabi shaft in the nw ¼ of the nw ¼ of section 21 T 58 R 19, which it recently bought from A. Maitland, of Negaunee. The shaft is an incline, of four compartments. Considerable ore will be mined for the coming year's shipments. This company has secured this 40-acre tract, the s ½ of section 11, same township, in which two small deposits have been proved up, and 160 acres in section 2 and 3, T 58 R 18, near the Mountain Iron mine and the Wahkootah exploration. These lands are all state leases and contain about 10,000,000 tons of ore, which will return the state school funds at least $2,500,000 before exhaustion.

NEW YORK MARKET REPORT.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, No. 15 NASSAU ST., Oct. 27.

There has been considerable said about sales of Southern pig iron for export, but on inquiry we are unable as yet to locate any. Representatives of Southern interests here say that any improvement of this kind would center in Southern No. 3 foundry, which they estimate would have to sell at about $8 before much could be sent abroad. Freights are important factors also. This grade of iron is now selling around $9.25, Birmingham, to quote the very lowest figure, which does not seem the market. A representative of a large selling firm says: "The pig iron market is a quiet one. Only a hand-to-mouth business is doing. Sometimes an inquiry comes in for a round lot, but it never develops into an order. Our leading salesman, just returned from a trip through New England, reports foundrymen doing a normal business, but indisposed to take a hopeful view of the outlook. It is this tendency to look ahead with fear and trepidation that gives the pig iron market a depressed tone. There have been no sales of iron for export, so far as I am aware, and none probable, I think, until prices are much lower than they are now."

The report that D. H. Bacon, the president of the Tennessee Coal, Iron & Railroad Co., has resigned, or contemplates doing so, is without any foundation. On Oct. 20 the directors of the company held a meeting, at which the report in question was discussed. At first the intention was to issue a formal statement, but the final conclusion was that the report should not be dignified by a denial.

Pig Iron.—Orders placed for pig iron the last week showed no change in the aggregate tonnage, but prices had more of a downward tendency. This was especially noticeable in Southern irons. About a week ago sales of No. 2 Southern foundry were made in this market on the basis of $10.75 Birmingham, but in the past week there were sales at $9.75. One large interest has been holding out for $10.50, but another interest equally large is selling at $10. Yet this last named company has lost business at this figure, and knows of some having been done at $9.75. In Northern irons there is more irregularity in prices than ever. Some furnaces are making no efforts to get orders because they cannot profitably take them at prevailing prices, but when asked their prices give figures that would make contracts profitable. These are often $1 above actual market prices. The general aspect of the market is unchanged. Buyers are adhering to their hand-to-mouth policy, and invariably call for quick shipment, often specifying the latest time their iron may be delivered. New York prices are as follows: Northern No. 1, $15.75 to $16.25; No. 2 X, $15.25 to $15.75; No. 2 plain, $15.00 to $15.50; Southern No. 1 foundry, $14.00 to $14.50; No. 2 foundry, $13.50 to $14.25; No. 3 foundry, $13.00 to $13.75; No. 4 foundry, $12.75 to $13.25.

Rails.—There is a fair business doing, but railroad propositions do not come in as quickly as anticipated. Authorities here do not expect any reduction to be made in the price of standard sections, although persistent reports to that effect are being circulated.

Finished Iron and Steel.—The entire finished material market is quiet. The American Bridge Co. has not yet closed any of the 28,000 tons noted in previous reports. It expects that its total business this month will aggregate between 30,000 and 40,000 tons. An examination of its books shows that both in the business done, and in the unfilled orders on its books, the record for the first nine months of this year equals that of 1901 and 1902. Bids on the Blackwell's Island contract—aggregating about 47,000 tons—will be received until noon on Nov. 5. The specifications are unchanged, and bidders must deposit a check of $1,000,000, and have the work done by Jan. 1, 1907. Iron bars are still weak, with the belief of lower prices for steel bars stronger than ever. In plates and sheets about the only fresh development of interest is that prices are a shade easier, with trading confined to narrow limits. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 1.79c to 1.86c; flange, 1.90c to 2c; firebox, 2.10c to 2.20c; refined iron bars, 1.40c to 1.45c; soft steel bars, 1.70c to 1.75c; steel sheets, in carloads, New York, No. 28, 2.75c to 2.80c; galvanized, 75 and 10 to 75 and 5 off.

Sorbitic Steel Rails.

The inferior wearing qualities of steel rails produced at the high temperatures necessitated by the rapid rolling of modern rail mills has for some years been and is yet a vital matter to railway engineers in America. For some years the slogan of these consumers has been—a lower finishing temperature! The rail manufacturers have on their part spent large sums of money to meet this demand without reducing the output of their mills. To what extent they have succeeded in this task we need not consider here. Searching in another direction for the same object, a better wearing rail, some railways have struck upon nickel steel, and are conducting tests of nickel steel rails at large cost. That railways are even considering for rails a material of such cost and one, moreover, whost cost is bound to increase upon any large demand for it because of the limited amount of nickel available for alloying purposes, indicates the pressing nature of the demand for more durable rails. In view of these facts the announcement made by Messrs. Stead and Richards in their interesting paper [before the Iron and Steel Institute] that by a very simple heat treatment the life of steel rails can be increased from 25 to 50 percent is a most important one. In metallurgical language this increased durability is secured by the substitution of sorbite for a portion of the pearlite in the steel. To bring about this substitution it is only necessary to quench the heads of the rails to a certain temperature and allow the residual heat to temper the steel by the slow cooling of the rail. The process is in plain terms a simple hardening and tempering process. Accepting as a fact that this hardening and tempering process will perform all that is claimed the question arises whether it can be successfully applied to rails with the rapidity with which they are produced by modern rail mills. Messrs. Stead and Richards state that they have not yet an affirmattive answer to this question, although they hope to have one before long. It is in this item of practical manufacture that the new discovery, if we can so call it, is certain, it seems to us, to encounter the greatest obstacle to its useful application in rail making.—[*Engineering News.*

Operations have been resumed at the Joliet, Ill., plant of the Illinois Steel Co., after a shutdown of about two weeks.

The Brunk Machine & Forge Co., Lorain, O., recently organized, has purchased a site and will erect a building 40x100 feet.

The Francis-Nygren Foundry Co., Chicago, will build a foundry in Fillmore, near Rockwell St., one-story, 100x140 feet, at a cost of $30,000.

The Harvey Foundry & Machine Co., Chicago, has been incorporated with a capital of $25,000. The incorporators are: R. S. Folsom, Dwight Lawrence and J. R. Philip.

PERSONAL.

B. F. Fackenthal, Jr., president of the Thomas Iron Co., Easton, Pa., took charge of the various plants of the Consolidated Lake Superior Co. last week in the dual capacity of receiver for Speyer & Co. and president of the subsidiary companies. Mr. Fackenthal will be represented on the ground by his brother, J. S. Fackenthal. About 30 heads of departments were asked to resign and new appointments will be made, including probably many of those who have just resigned.

R. R. Shuman has severed his connection with the iron and steel brokerage firm of A. M. Crane & Co., Chicago, of which he was assistant secretary and treasurer, to become Western editor of the *Iron Age*, with office in the Fisher building, Chicago. Before going to A. M. Crane & Co., Mr. Shuman was advertising manager for Joseph T. Ryerson & Son, Chicago, and editor of their monthly journal and other publications.

T. J. Heller, formerly New York agent for the Federal Mfg. Co.'s steel ball department, has left that company and has taken the sales management of the ball business of the Standard Roller Bearing Co., which has recently purchased the ball business of the Grant Tool Co. Mr. Heller's address will be care of the Standard Roller Bearing Co., 48th St. and Girard Ave., Philadelphia.

John Calder, formerly with the New York Shipbuilding Co., Camden, N. J., has resigned the position of executive engineer to the C. W. Hunt Co., New York, to become general manager of the Remington typewriter factories at Ilion, N. Y.

H. P. Young, purchasing agent for the Allis-Chalmers Co., Chicago, has resigned and has been succeeded by E. N. Dickson, of Milwaukee, purchasing agent of one of the constituent companies in that city prior to the formation of the present organization. The general purchasing of the company will hereafter be consolidated in Milwaukee, though each branch will have a local purchasing agent who will look after the small daily requirements. Mr. Young had been with the Allis-Chalmers Co. and one of its constituent companies for more than ten years, and has spent the best part of a lifetime in the purchasing departments of large corporations. He had an extensive railroad experience before accepting the post he last held.

George Greer, general manager of the New Castle, Pa., plants of the American Tin Plate Co., denies that he is going to resign and move to California. He says there is no foundation whatever for the circulation of this report.

U. G. Orendorff, of the Parlin & Orendorff Co., Canton, Ill., has been elected president of the Illinois Central Electric Railway Co., on whose line construction work is soon to begin.

S. B. Sheldon, superintendent of the Illinois Steel Co. plant at Joliet, Ill., has resigned to accept a position with the Lackawanna Steel Co. at Buffalo.

S. S. Kerr, who was a foreman at the plant of the Youngstown Iron, Sheet & Tube Co., Youngstown, O., has accepted a position in charge of the construction of the new mills in process of erection at Lorain, O.

Oliver Phelps, general manager of the Lorain Foundry Co., Lorain, O., was given a gold watch, chain and charm by the employes of the company on Oct. 27—an expression of the cordial relations which have existed between the management and employes at this plant. On Nov. 1 Mr. Phelps' resignation takes effect and he becomes M. A. Hanna & Co.'s sales agent at Detroit for the output of the Detroit Iron & Steel Co.'s furnace.

Albert Tracy De Forest, manager of the Cleveland district of the American Steel & Wire Co., has been made manager of the company's business on the Pacific Coast and will start Oct. 29 for San Francisco, where he will have his headquarters. In the past few days Mr. De Forest has received many expressions of good will from those who have come to know and highly esteem him during his long connection with the iron and steel business in Cleveland. Monday evening the heads of departments of the company presented him a very handsome gold watch, chain and charm and an autograph album, in which each had written a few lines expressing regret that the pleasant relations must be severed and good wishes for the future. Tuesday evening a score of his old friends tendered him a complimentary dinner and gave him a dress suit case with elaborate furnishings. Mr. De Forest was for a number of years secretary of the H. P. Nail Co., of Cleveland, and has been with the American Steel & Wire Co. since its organization, first under the laws of Illinois, and later under the laws of New Jersey and as a constituent company of the United States Steel Corporation.

Proposed German Steel Syndicate.

News of German iron and steel syndicate operations and of efforts for new syndicates has been plentiful of late. The Lorraine-Luxemburg Pig Iron Syndicate has been renewed for five years and along with this announcement comes the statement that the attempt to form a German steel syndicate has more promise of success than at any time since negotiations were begun. The project contemplates control of the total inland output of raw steel produced; the whole inland output of semi-finished steel, railway, and other rails and fastenings, and I, U and Z iron; bar and hoop iron, rolled wire, heavy sheets and light sheets; pipes, railway axles, wheels and tires, wrought and other steel castings, steel rolls, etc. Each maker is to be given an allotted production in the combination, which is to bear the title of the German Steel Syndicate, and is to be established for five years as a beginning.

If a firm sells more than its apportioned output it will have to pay a fine of 5s for each ton in excess, while at the same time if less than its allotted production is sold it will receive payment at the rate of 5s per ton for the deficiency. In the event of the total demand increasing beyond the aggregate production fixed by the syndicate, it is intended to increase the output of the associated works proportionately, and to reduce it in a similar manner in case the demand becomes less than the stipulated maximum output. The committee appointed to promote the scheme has received replies from most of the steel works, and from these it is obvious that considerable difficulties have yet to be overcome before the plan can be carried into effect. The principal stumbling-block is said to lie in the fact that the apportionment demanded by various works is greater than that proposed by the committee, some of the establishments asking for nearly four times the suggested tonnage. A two days' conference of representatives of the interested works has been held at Düsseldorf, presided over by Herr Kirdorf, of Aix-la-Chapelle. The proceedings took a favorable turn, and a committee was appointed to bring about an agreement in regard to the apportionment of each works. It is expected that a general understanding will be reached at the next conference, in which event the syndicate will come into operation at the beginning of January.

It is reported that smaller steel producers who are not to be taken into the syndicate are agitating an organization. The question of raw material supply is their great problem. The syndicate expects that in their organized capacity the steel makers of Germany will be better able to meet the competition of the United States Steel Corporation in outside markets.

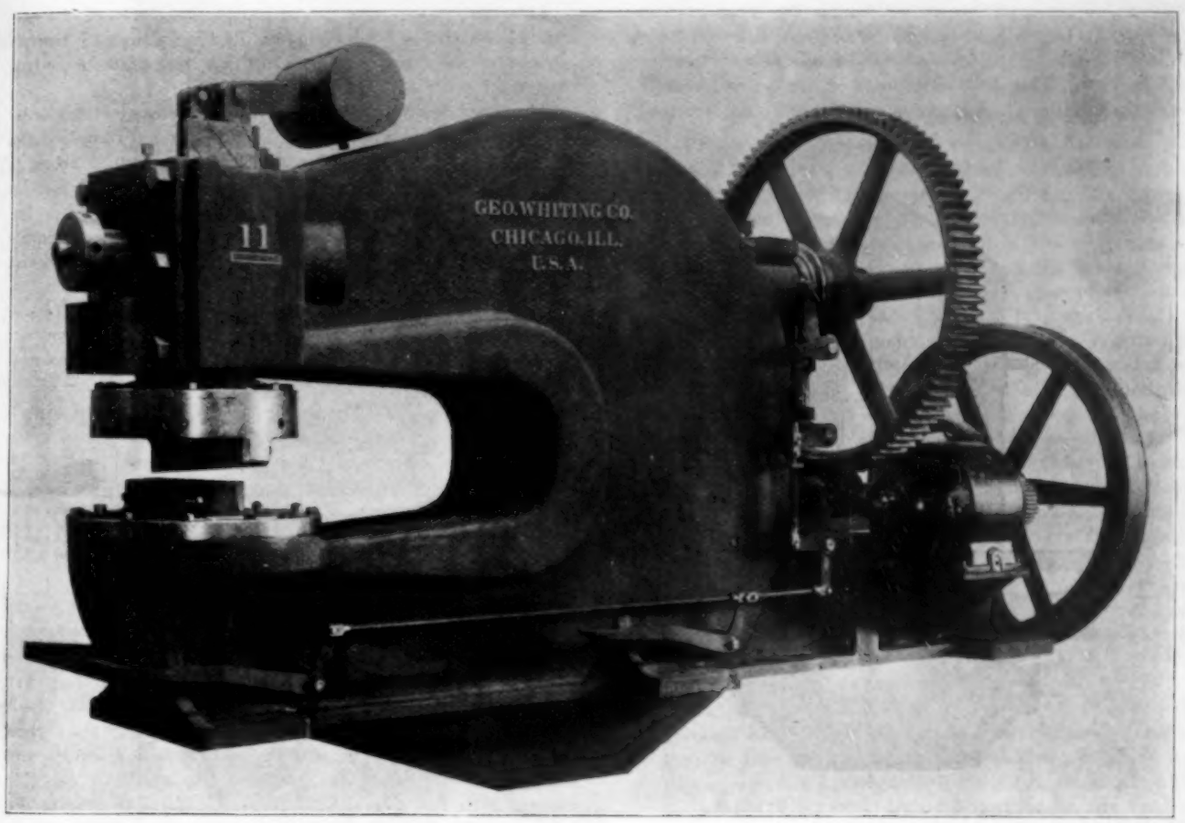
H. Silberman & Co., one of the leading scrap iron firms of Cleveland, went into voluntary bankruptcy Oct. 27. The cause of the failure was shrinkage in the value of scrap iron and also to investment in an industrial enterprise which did not prove successful. The firm owes $197,573.97 and has assets aggregating $190,269.36. Nathan Loeser and A. V. Gannon have been appointed receivers. Harry Silberman personally, has secured claims against him amounting to $70,000 and unsecured claims amounting to $20,000. He owes in all, he states, $90,013 and has $86,550 assets. David Silberman, the schedule states, owes $1 and has no individual assets.

The Vilter Mfg. Co., Milwaukee, Wis., is building an addition to its pipe shop. It reports a good volume of new business.

The Nashua Iron & Brass Foundry, of Nashua, N. H., has been sold to James H. Toller & Co. of that city.

SPECIAL SPLITTING AND ANGLE SHEAR.

The halftone represents a type of shear recently brought out by the George Whiting Co., of Chicago, which has some special features of interest to users of steel plates. The sliding head and lower jaw are fitted with shear blocks which revolve on a common center, so that the shear knives are always in alignment. These blocks are made so that the machine can be used not only as a splitting or crosscut shear but can be readily changed so as to cut at any angle, allowing large plates to be cut without swinging around and also allowing sketch plates to be cut with less waste than usual. The blocks are graduated and furnished with an index for setting quickly. The main frame is the ordinary deep throat type, made extra heavy and designed to stand the heaviest duty. The sliding head is specially designed, with longer bearings than usual, to compensate for extra length of blades. The crank shaft is made of best forged steel and is extra heavy



A NEW WHITING SHEAR.

for the service required. The machine is fitted with the Whiting improved automatic stop clutch and treadles for operating this device are placed on both sides, back of the throat as well as in front, so that the shear can be operated easily when cutting wide plates. The machine as illustrated has 48-inch throat and will cut to center of eight feet, making a cut 24 inches long at each stroke. The machine is built with any depth of throat desired and with either belt, motor or engine drive.

Leander Heald & Son, machinists, Barre, Mass., have dissolved their partnership, one of the oldest in the city. James Heald, junior member of the old firm, becomes treasurer and general manager of the newly organized Morgan Machine Co., at Worcester, Mass. A large part of the machinery in the Barre plant will be removed to Worcester. The new company will have a well equipped plant and will engage in the general machine business.

The Franklin Furnace, Clinton, N. Y., will be blown out for an indefinite time. The mines in the vicinity of Clinton have been closed.

THE STEEL RAIL SITUATION IN RUSSIA.

U. S. Consul-General J. D. Hughes, Coburg, Germany, writes of a recent conference at St. Petersburg, between state officials of the various departments and representatives of mining districts and rail producers, to consider price paid for rails by government railways, also the causes of the continued depression in the iron trade of Russia.

"Some time ago the Russian Government consented to pay 1.25 rubles (64 cents) per pood (36.112 pounds) for rails for three years, in the hope of assisting the industry, and as that period has practically expired and the cost of production, based upon the present prices of raw material, is now lower, it was officially hoped to secure a reduction for the delivery of finished rails in the future. It was, however, urged on behalf of the rail makers that the existing rate of 1.25 rubles (64 cents) is moderate, and that it leaves little profit, owing to their being bound by long contracts for pig iron and fuel. No decision, I am informed, was arrived at on the subject of the future price to be paid for rails.

"As to the question of the prevailing depression, some of the representatives repeated what has been stated at former conferences, namely, that the principal cause lies in overproduction throughout the country and that it is necessary first of all to remedy this evil. On the other hand, the majority of the ironmasters expressed the opinion that the whole iron and steel industry would be considerably strengthened if the government would divide the rail orders for the state railways among all the works, instead of, as in the past, placing them with six firms only. This contention, they claimed, was only a reasonable one, seeing that the six favored works, aided by the large Imperial Government orders, have been enabled to dispose of their surplus production in the open market at such low prices as to affect other works prejudicially."

The American Steel Foundries, Indiana Harbor, Ind., have ordered a 300-h. p. direct connected unit from the Ball Engine Co., Erie, Pa.

LONG-TUYERE CONVERTER FOR SMALL CHARGES.

From a paper on "The Development of the Bessemer Process for Small Charges," prepared by Bradley Stoughton, of New York, for the American Institute of Mining Engineers, we take the account given below. It details Mr. Stoughton's work in designing and building a plant for the manufacture of small steel castings in connection with an open-hearth foundry plant of some years' standing. The molds for the small castings were to be made with a machine. The Tropenas converter was considered the best available design, but the fixed bottom, with its high expense for repairs, was objectionable, Mr. Stoughton says, as was also the stack, which was thought too short, in view of the excessive spitting which sometimes occurs. The necessity of installing three converters in order that one might be available for use all the time, was regarded as a further drawback. A long-tuyere converter was hit upon as meeting the requirements and as obviating some of the difficulties with previously existing types. The writer says:

"Several other modifications not unlike the Tropenas have been patented in this country, and one of these was seen during the investigation of the problem, which was best for the purpose in view. This had been operated for several months; none of the others had been operated at all. All are based

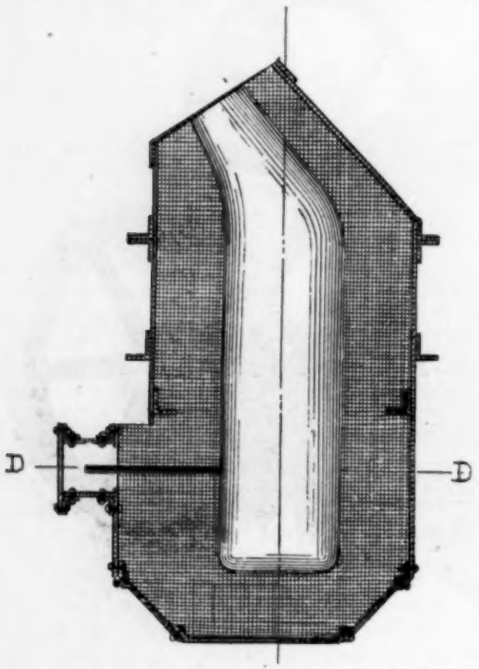


FIG. 1.—SECTION OF LONG-TUYERE CONVERTER.

on ideas or principles patented by Bessemer more than 30 years before, and all appear to be either a return to bad principles which had been abandoned elsewhere, or else they were too impracticable in design to command attention. I have not read, in patent specifications or elsewhere, a single valuable manner of blowing iron which was not patented by Bessemer in the fifties. Bessemer himself called attention to the fact that royalties were being paid on 'patents' which he had anticipated years before, and said that the public was now freely welcome to much for which it paid a high price.

"A type of converter was finally determined upon, which would give conditions more oxidizing and less irregular than those of Robert, but not so oxidizing as those of Tropenas. Thus, the tuyeres were neither below nor above the level of the bath, but on the same level, parallel and pointing downward very slightly. There is no claim for novelty in this practice. It is indirectly covered in several of Bessemer's patents, and definitely covered in his patent, No. 630, of 1856. Drawings of the converter, which was erected at the works of Benjamin Atha & Co., of Newark, N. J., and first operated in October, 1901, are shown in Figs. 1, 2 and 3. Since then two more like it have been added to the plant. All are of two tons capacity each. The bottom is removable, and the vessel is rotated by means of a rack and pinion in the usual way. To reduce the spitting, the stack is made very high, and, for still greater saving in the matter of loss, the lining on the tuyere side is very thick, thus allowing the tuyeres to be extra long. The tuyeres are placed in the back, which is flat. For tuyers I prefer six two-inch pipes rammed in the refractory lining, with the outer ends projecting 6 inches into the wind-box, to increase their length further. Two-inch wooden plugs also have been used, and withdrawn after the lining has been rammed around them, and 1.5-inch tuyeres also have been used with success. For the first vessel one extra bottom only was supplied. After what has been said above, it is needless to add that the plant is equipped with such metal scales that, for every heat, the weights are taken of cold pig iron, melted pig iron and steel in the ladle.

"When practice had shown that the converter worked as expected, and that the steel was amply hot for the purpose for which it was intended, it remained to study the conditions inside it to determine just how oxidizing or reducing they were. It is clear that, if oxidizing, there will be a waste of blowing power of iron and of heat; if not sufficiently oxidizing—that is, if the carbon is not all burned to CO_2—then we are not getting all the heat we might. The ideal condition, of course, is when all the carbon is burned to CO_2, and there is no free oxygen left.

"The simplest and most definite way to determine this is by examination of the escaping gases, which was accordingly done. They were taken off through a 2-inch pipe, extending from 24 to 12 inches inside the vessel's mouth, being forced out by their own pressure, and collected in the usual way, after being allowed to issue for at least 60 seconds before each sample was taken. The history of the blow was as follows, and the results of the analyses are shown in Table 1.

TABLE I.—ANALYSES OF SIDE-BLOWN CONVERTER-GASES.

Sample No.	Time After Beginning of Blow.	ANALYSES—PER CENT.				CALCULATIONS FROM ANALYSES—PER CENT.			
		CO.	CO_2.	O.	N. & H.	Total O.	N. *a*	O. Entering.	O. Burning Si & Fe & Mn.
1	4 min., flame starts	0.0	8.2	1.1	90.7	7.1	88.7	23.6	16.5
2	10 min., boiling	0.3	24.3	0.4	75.0	18.3	73 0	19 4	1.1
3	12 min., shortening *b*	0.4	8.8	0.2	90.6	6.8	88.6	23.5	16.7
4	17 min., after first drop	10.7	13.0	0.2	76.1	15.8	74.1	19.7	3.9
.....	21 min., end of blow								

a H being estimated as 2 percent.

b *i. e.*, just before the first drop. There are two drops to the flame in this operation, the second marking the end.

"The pig iron contained about 3.50 percent carbon; 2.15 silicon; 0.55 manganese; 0.05 phosphorus; and 0.035 of sulphur. The first sample was taken one minute after the carbon had begun to burn. As soon as the flame was white and strong, the converter was turned back the least possible amount, thus reducing slightly the angle of the tuyeres to the bath, and also lowering the level of their mouths. The blast-pressure was reduced from 4 to 3.5 pounds per square inch. The red smoke then gradually decreased in volume, and, finally, ceased, the flame becoming larger and more intense.

"The second sample was then taken. Very soon the flame began to shorten, and the red smoke appeared again. The third sample was then taken. Finally, the flame dropped distinctly, but without disappearing. Red smoke was still in evidence. The fourth sample was then taken. The red smoke gradually disappeared as the flame became large. The flame became larger, more violent and whiter than at any time before, but was also freer from spitting, there being almost nothing projected from the mouth of the converter. This continued until the final drop.

"The analyses show that, except for the last five minutes of the blow (say, 30 percent of the time the carbon is burning), the gases are completely oxidized, and that even during this last period, 44 percent of the carbon is completely oxidized. Altogether, then, about 83 percent of the carbon is completely oxidized, so that, if we could introduce the exact amount of free air, and succeed in burning the carbon monoxide, we would gain about 10 percent of heat; but the air must be introduced directly to the surface of the bath, and at exactly the proper time, or the bath will not get the full benefit, and will be subjected to some unnecessary cooling effect.

"The first deduction from the above facts was that the carbon burned so fast during the last few minutes that there was not enough oxygen supplied to oxidize it completely. But, on the other hand, the temperature of the gases is increasing all the time of the blow, and it is well known that, at very high heats, CO_2 dissociates almost as fast as it is formed. The action is progressive, and the exact relation between the temperature and degree of dissociation is doubtful; but the presence of iron and hydrogen materially increases it. Therefore, we had not yet enough facts to make accurate deductions.

"Obviously, the lack of oxygen at the end could be remedied by retaining the blast-pressure at 4 pounds, instead of reducing

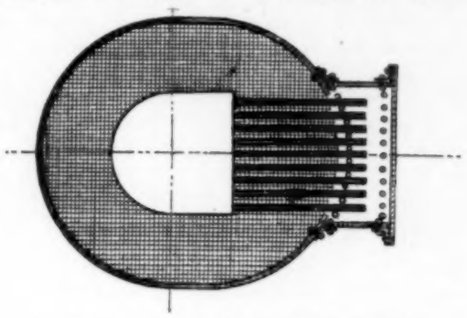


FIG. 2.—HORIZONTAL SECTION ON D–D, FIG. 1.

it as stated. This was therefore tried, with the first result of reducing the time of blow from 21 to 14 minutes. The metal was hotter also; but whether this was due to the shortness of the blow or to higher oxidation of the gases than before could not then be told.

"A gas sample was, therefore, taken at a period in the blow corresponding to sample No. 4 in Table 1. It analyzed as follows: 10.5 percent of CO; 10.2 percent of CO_2; 7.4 percent of free oxygen. Now, there is about the same relation between the amounts of CO and CO_2 as before, although we have 7.4 percent of free oxygen present. Therefore, the incomplete oxidation of carbon towards the end of the blow is not due to lack of oxygen, but to the dissociation of CO_2 at

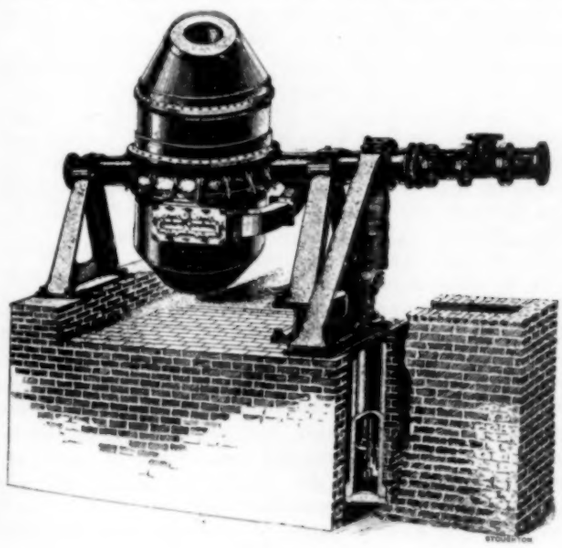


FIG. 3.—THE LONG-TUYERE CONVERTER.

that temperature, and no amount of extra air blown would remedy it, whether supplied by a second set of tuyeres, or otherwise.

"The Process.—All grades of pig iron from 1.25 to 3 percent of silicon have been used. The heat obtained, when using the first grade, is ample for all casting work, but not quite so high as when we have more silicon, as one would expect, for, though the extra high temperature is obtained from superoxidation of carbon, and not from oxidation of silicon, yet the latter aids somewhat. The conditions are not the same as in the regular Bessemer blow, where the carbon is not burned to CO_2 to such a large extent, and, therefore, the greater amount of heat comes from burning silicon. I prefer a pig iron with not more than 1.6 percent of silicon before melting. The iron is all cupola-melted, and the waste, including that of the cupola, is from 15 to 17 percent, according to the iron used.

"Bottoms last from 10 to 12 heats, and must then be patched somewhat. This may be repeated several times before the lining has to be removed entirely. Relining of both bottom and vessel is accomplished very cheaply and quickly.

"On account of the cheapness of starting up these small converters, almost all types of them are operated in daylight only. Up to the time of this writing (April, 1902), the machine-molding foundry, which is building to supply the converter which we are now considering with molds, is not completed, and the plant is limited in capacity to the molding floor allotted to it. It thus makes from 20 to 30 tons each afternoon (from 1 to 6 p. m.), and uses the morning hours for patching, drying and heating. This product is equal to the total average (10 hours) output of the largest Tropenas plant in this country, which contains three converters, each of them being the same size as the one we are now considering. This difference in product, per vessel per hour, is due mainly to the length of time taken to reline and dry the fixed-bottom converter, and the use of the extra bottom."

The Pennsylvania Railroad's Policy.

President Cassatt, of the Pennsylvania, has made the following explanation of the reduction in working forces and abandonment of improvements:

"We have stopped part of the construction work, but it is a comparatively small part, and not a general reduction. It includes the heavy work on the low grade improvements between Columbia and Parkersburg, and between Thorndale and Paoli, on the Philadelphia division. This work could not, in any event, have been completed in less than a year or eighteen months, and the expectation is that we shall go on with it in the spring. This is the only work of importance which is stopped. All the rest of construction work on the line is going actively on. We have also, as stated in the papers, made considerable reductions of force in the operating department. During the congested period of last fall and winter, considerations of economy had to be put to one side; it was necessary to move the traffic at any cost, and as a consequence the number of men in the service, was largely increased. By the reductions now being made we are simply returning to normal conditions. Our lines are now working freely, and we anticipate no trouble in moving the traffic during the coming winter."

The Interstate Commerce Commission has granted to Pennsylvania Railroad on its lines east of Pittsburg extension of time to July 1, 1904, to comply with the law which requires that every train operated shall be composed of not less than 50 percent of air brake cars. Extension was granted on the ground that the great volume of business the road is now doing could not be handled with limited yard facilities and at the same time place the necessary 50 percent air brake cars in each train. On Pennsylvania lines west of Pittsburg a similar extension was granted to Jan. 1, 1904. A similar extension to Jan. 1 was granted a number of roads, including Erie, Lehigh Valley, Boston & Maine, Cincinnati, Hamilton & Dayton.

Unfficial reports show that the imports of pig iron through New York and other Eastern ports in September amounted to only 15,462 tons. The scrap iron, old iron rails, bar iron, structural iron, steel billets, steel beams, steel wire rods, scrap steel and old steel rails aggregate about 25 percent less than the tonnage imported in August. The iron ore, manganese and chrome ore imports in September were about 25 percent less than in the previous month.

The Florence Machine Co.'s plant Northampton, Mass., has been placed in the hands of a receiver. An effort will be made to interest new capital and reorganize the company. Light machinery and oil stoves have been the product.

Implement Manufacturers Favor Reciprocity and Tariff Reduction.

Reciprocity and foreign commerce were the principal subjects discussed at the convention of the National Association of Agricultural Implement and Vehicle Manufacturers held in Cleveland last week. The committee on foreign commerce in its report strongly advocated consular reform, saying in part:

"Our consular service can be very decidedly improved by placing it on a civil service basis and by making the tenure of office permanent, as long as satisfaction is given, and we suggest that to obtain good men the compensation be sufficient to enable them to live as becomes representatives of the United States; at least, we can afford to pay our consuls as much as other nations. We believe that a system of specific information from our consuls could be evolved that would not only stimulate our efforts for foreign trade but enable us to act intelligently in attempting to meet its requirements, and thus secure to the manufacturers of the United States a greater share of the world's commerce. It is claimed that a large part of Germany's foreign trade has been obtained through the assistance of the consuls. Surely American enterprise may be properly exemplified by its consular service."

Reciprocity with Canada.

Hon. John Charlton, a member of the Canadian parliament, addressed the convention on "Reciprocity with Canada." He said in part:

"Canadian exports to the United States, excluding the precious metals, have been kept down practically to the figure of 1866, while a moderate Canadian tariff has permitted a remarkable expansion of American exports to Canada. Heavy balances of trade have been made against Canada, and if that country chose to permit the continuance of present conditions, the United States could afford to adhere to its present policy. The present condition of affairs, however, is about to end, either through the adoption by the United States of a more liberal policy, or through the adoption by Canada of a more restrictive one. The present character of the Canadian tariff as compared with that of the United States can be shown almost at a glance. For the year ending June 30, 1903, our average rate of duty upon total imports from the United States was 12 and our average rate of duty upon dutiable imports from that country was 24½ percent. The same year the American duties were approximately 25 per cent on total imports from all countries and 50 percent upon dutiable imports, and the rate upon total imports from Canada would exceed 25 percent. For the same year the dutiable imports from the United States were $75,278,000, and the free imports $69,485,000, a total of $144,763,000. The total exports of Canada to the United States the same year were $71,209,000, of which $18,807,000 consisted of precious metals, chiefly from the Yukon district, leaving a balance of trade against Canada of $73,554,000 on the total trade transactions of 1903. By eliminating the precious metals, coin and bullion from the exports of each country, taking the amount of imports from the United States entered for consumption and dropping the list of foreign products from Canadian exports, leaving only the $67,766,000 of Canadian merchandise exported, the actual balance of trade against Canada for the year 1903 will be found to be $79,832,000. This general condition of trade matters has existed for the last thirty years, and since the abrogation of the reciprocity treaty in 1866 the aggregate of the balances of trade against Canada and in favor of the United States exceeds $600,000,000.

"Providence seems to have designed the North American Continent as the home center of Anglo-Saxon power. The resources of the territory upon this Continent in the possession of the English-speaking race are enormous, and not yet fully comprehended. The entire region would form a vast compact, and unassailable empire, with capacity for sustaining five hundred million people. The policy of the near future will shape the destiny of this mighty land. The best and most effective efforts of the political leaders of the United States for more than a generation have been of a character to promote discord, to destroy harmony and community of interest, and to secure the establishment of two nations; one pressing to the utmost every advantage of position and preponderance of wealth and influence; the other smarting under a sense of ungenerous treatment. Is it advisable to continue these conditions? Separate autonomy is not inconsistent with harmonious relations. Common purposes and unity of action, and the future may be made conducive to the welfare not only of these two immediately interested parties, but also the entire English-speaking world.

Reciprocity Resolutions Adopted.

The committee on reciprocity reported as follows:

WHEREAS, the members of this association, and we believe a large majority of the people of the nation, believe that our tariff duties in many instances are too high, and that gradual reductions should be made; and,

WHEREAS, the policy of attempting revision by legislative action has always tended to extend discussions in Congress, and created during that time long periods of unrest and disquietude in industrial and business circles, and seldom has accomplished any satisfactory or material reduction and if attempted again, will secure no equivalent concession from foreign countries; and,

WHEREAS, the dominant party of the nation has on more than one occasion committed itself in convention platforms and by legislative action to the policy of reciprocity and to the promotion of the commercial treaties and many of its most brilliant and able statesmen have strenuously urged the faithful performance of this party engagement; and

WHEREAS, in the early period of this country's existence protection to manufacturers was established in order to enlarge our domestic market, encourage imigration, diversity industries, furnish a greater opportunity for a diversified talent, and afford a larger field for enterprise, and establish an independence of foregn nations in supplying ourselves with the necessary military supplies during the exigencies of war, in all of which we have succeeded to a marvelous extent; and

WHEREAS, it would now appear as though high protective duties had to a very large extent accomplished their purpose in development, and that a more moderate tariff should now suffice to maintain our industrial supremacy, and that reasonable concessions can safely be made with a view of augmenting and extending our foreign trade; therefore, be it

Resolved, that we urge upon Congress the faithful performance, not only of the repeatedly expressed, but the implied promises contained in the Republican platforms, and the utterances of the Republican leaders who have favored reciprocity by ratifying treaties already before them and thus encouraging the negotiation of other treaties equally desirable and carry out the policy of our late lamented President, the Hon. William McKinley, who so ably advocated the principles of reciprocity in his last public address.

W. B. Brinton, of the Peru Plow & Wheel Co., Peru, Ill., opposed the resolutions and advocated the taking off of the duty on iron and steel entirely, but the report was adopted with only two dissenting votes. Resolutions were also adopted as follows: Favoring the appointment of a tariff commission; indorsing the Lodge bill for the reform of the consular service; favoring the policies of President Roosevelt on irrigation and forestry; advocating improvement of roads; expressing appreciation of the valuable service of the trade papers; and especially commending that feature of the new irrigation law which reserves the reclaimed land for actual settlers and home makers.

New Officers Elected.

The following officers were elected: President, F. E. Myers, of F. E. Myers & Bro., Ashland, Ohio.

Vice Presidents: Frederick S. Fish, Studebaker Bros. Mfg. Co., South Bend, Ind.; H. R. Stoepel, Gale Mfg. Co., Albion, Mich.; Danforth Gear, Walter A. Wood Mowing & Reaping Machine Co., Hoosick Falls, N. Y.; C. H. Adams, Marseilles Mfg. Co., Marseilles, Ill.; H. M. Wallis, J. I. Case Plow Co., Racine, Wis.; E. P. Curtis, Richardson Mfg. Co., Worcester, Mass.; J. W. Bettendorf, Bettendorf Axle Co., Davenport, Ia.; O. V. Dodge, Kansas City Hay Press Co., Kansas City, Mo.; Wm. B. Hardy, Brinly-Hardy Co., Louisville, Ky.; Frank C. Johnson, American Seeding Machine

Co., Springfield, O.; R. S. Buch, A. Buch's Sons, Elizabethtown, Pa.; H. W. Avery, Avery Stamping Co., Cleveland.

Treasurer: Walter A. Rosenfield, Moline Wagon Co., Moline, Ill.

Executive Committee: Chairman: W. W. Collier, American Harrow Co., Detroit, Mich. Members of committee, each for three years: W. M. Kinney, Winona Wagon Co., Winona, Minn.; C. G. Rowley, Aspinwall Mfg. Co., Jackson, Mich.; S. E. Swayne, of Robinson & Co., Richmond, Ind.

Chattanooga, Tenn., was selected as the next place of meeting.

The Convention Banquet.

The banquet, which was held in the Chamber of Commerce assembly room on the evening of Oct. 22, was a brilliant success. About 400, of whom one-fourth were ladies, were present. The guests were seated at small tables in parties of ten, this arrangement adding much to the sociability of the evening. The retiring president, Martin Kingman, of Peoria, Ill., presided, and the speakers were Hon. James Wilson, Secretary of Agriculture, Congressman Theo. E. Burton, of Cleveland, Harvey D. Goulder, of Cleveland, and Rev. Dr. C. W. Hiatt, pastor of Euclid Avenue Congregational church, Cleveland. Congressman Burton spoke on "New Fields to Conquer," giving statistics showing the wonderful development in agriculture and manufacturing, and discussing methods of extending foreign trade. Secretary Wilson's subject was "The Agricultural Future of Our Country." He spoke with great earnestness and force. He told in some detail what the agricultural department is doing for the farmers. Mr. Goulder, in speaking to the subject, "Some Industrial Problems," advocated moderation in treating labor questions. The response of Dr. Hiatt to the toast, "Women of America," was the oratorical gem of the evening. By his humorous sallies, and eloquence, Dr. Hiatt captivated his hearers and was enthusiastically applauded. The presence of ladies at the opening session of the convention and at of the social functions, including the banquet, was a delightful feature of the sojourn of the manufacturers in Cleveland.

Steel Corporation Bond Conversion.

Application has been made to the stock exchange to list $133,000,000 sinking fund 5 percent bonds of the U. S. Steel Corporation. The official announcement that at least $113,000,000 of the $200,000,000 of preferred stock set apart for conversion into 5 percent bonds had actually been converted, shows that approximately $87,000,000 remains to be converted. As the underwriting syndicate has had its tenure extended from Oct. 1 last to July 1, 1904, it has over eight months in which to complete the conversion. The net result of the conversion project now appears to stand:

Stock converted	$113,000,000
Stock to be converted	87,000,000
Bonds sold for cash	20,000,000
Bonds exchanged for stock	113,000,000
Bonds to be sold for cash	30,000,000
Bonds to exchange for stock	87,000,000

The profit to the underwriting syndicate on commissions on the stock converted and bonds sold, is approximately $4,333,000.

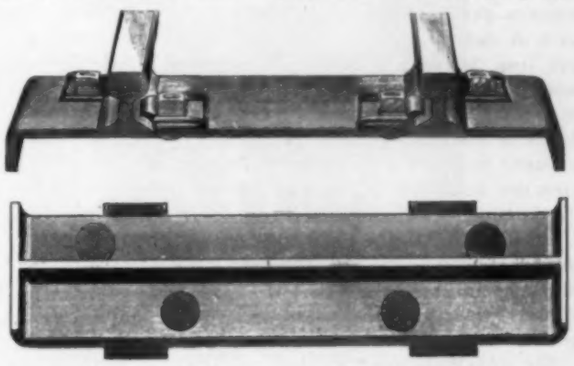
Work is rapidly nearing completion on the third furnace at the Port Oram, N. J., group operated by Joseph Wharton. The new stack will have a daily capacity of 400 tons and is being constructed along the most modern lines known in blast furnace engineering. The work is under the superintendency of Edward Kelly, manager, and the designers, the engineering firm of Frank C. Roberts & Co., Philadelphia. The plate construction was done by the William B. Pollock Co., Youngstown, O., blast furnace builders.

Shopwork at the Massachusetts Institute of Technology has been discontinued. Instead the students now "practice the mechanic arts" in the "carpentry laboratory," in the "foundry laboratory," in the "forge laboratory" and in the "machine laboratory."—[Sibley Journal.

SALISBURY STEEL & IRON CO.'S STEEL TIE.

The Salisbury Steel & Iron Co., of Utica, N. Y., closed negotiations last week for the general assignment to the company of the Knox patents for steel railroad ties. The Knox tie has been carefully examined by several prominent railway officials and engineers and is found to have several advantages without the disadvantages embodied in some designs of steel ties. It is simple in construction, consisting of a cast T shape of open-hearth steel the top of which is about 10 inches wide, 8 feet long, ⅝ inch thick. The flange extends the whole length of the under side, in the center, and is joined to a cross-piece at each end, both the central under-flange and the ends being 4 inches deep, and of the same thickness as the top plate. The rails are held in place by steel clips, which are in turn bolted to the tie. Among the advantages claimed for the Knox tie are the ease with which it can be tamped from either side; the anchorage made by the central flange and the ends, preventing the tie sliding in any direction on the roadbed; the central flange stiffening the upper plate sufficiently to support the heaviest loads without injury to the tie or rolling stock; also increased ductility.

The Salisbury Steel & Iron Co. was incorporated in November, 1902 under the laws of the State of New York, with an authorized capital of $1,000,000, all common stock, shares of the par value of $100 each. The company has



THE KNOX ROLLED OR CAST STEEL CROSS TIE.

acquired by outright purchase about 520 acres of ore lands in Salisbury township, Herkimer county, N. Y., and during the past summer has been sinking shafts at different stations on the property. The ore is a very high grade magnetite, low in sulphur and phosphorus and free from titanium. It occurs in the contact of granitic gneisses and limestone, and outcrops on the property for over 6,000 feet. In shaft No. 2, the vein at the outcrop was only 22 inches in width, but at 90 feet this has increased to 14 feet wide, analysis showing that the ore increases from 58 percent to 63 percent metallic iron, and showing a decrease in sulphur and phosphorus. Mining engineers have examined the property and say it is very extensive and of considerable value.

The Salisbury company proposes to install a complete drilling plant to be run by electricity, for getting out the ore, and also a grinding, crushing and magnetic concentrating plant, to bring the ore up to a high percentage of metallic iron. It has been found that by concentrating the ore, the sulphur, occurring in small grains of pyrite, and the phosphorus, which is carried in grains and laminae of apatit, are readily removed, resulting in concentrates of quality. These are then to be treated by the Ruthenburg process of electrical reduction, by which they are fritted together, producing a very desirable melting stock for the open-hearth furnace. The Salisburg company proposes to erect an open-hearth steel casting plant, either at the Salisbury mines or in Utica, N. Y., and there use this melting stock in the manufacture of the Knox tie. The analysis of the melting stock is all that could be desired for this purpose.

The contract for the Ruthenburg process has adready been made, and the company is now pushing work on the site for the new works, hoping to have them in operation in the spring of 1904.

Steel Castings and the Tropenas Process.*

BY ARTHUR SIMONSON.

One of the most useful materials of which we have any knowledge at the present time, steel is probably one of the least generally and thoroughly understood. So complex is its nature, so manifold its different forms, compositions and methods of manufacture, that it has been up to the present time almost a matter of impossibility to give a correct and concise definition of the word steel. Many definitions have been attempted, all of which have fallen short of completeness and accuracy. The three most important commercial alloys of iron—wrought iron, steel and cast iron—have so many points in common, and their features and characteristics overlap at so many points that it is very difficult to separate them into three distinct classes and say on this side lies wrought iron, on that side steel and on that side lies cast iron. For the purpose of this paper all special or alloy steels such as tungsten, nickel or chromium steels will be left out of consideration.

Steel and Its Characteristics.

The old rough and ready definition was that iron alloyed with carbon up to a certain percentage was wrought iron; between certain higher limits was steel, and above the limit of steel was cast iron. This of course was more or less true, but how indefinite it was, and it has become more and more inaccurate as mild steels have become more easy of manufacture. Material can be made today which is identical in chemical composition with the best wrought iron and yet it is undoubtedly steel. Evidently then the definition of these alloys of iron as based upon the amount of carbon needs to be modified and enlarged.

Another definition largely used was that steel was iron containing carbon between certain limits which had been subjected to fusion, causing a more complete combination of the carbon with the iron. This again was incomplete as it did not include blister, shear or puddled steel.

The advances made in chemical research, and the aid rendered by the microscope, have made it possible to formulate accurate, if somewhat bulky, definitions. Dr. H. M. Howe's book on "Iron, Steel and Other Alloys," expresses the case with wonderful clearness and shows that at the borderland between wrought iron and mild steel, the deciding feature is the presence or absence of slag. Owing to the method of its manufacture, wrought iron has always incorporated in its structure more or less slag, in the form of veins of fibers, and it is never remelted again to give the slag an opportunity to be eliminated; if this were done the wrought iron would become steel. The decision between steel and cast iron is easier to make, being chiefly a question of malleability between certain temperatures. Steel is always malleable at some temperature, whereas cast iron contains so much carbon as not to be malleable under any circumstances. Malleable iron is a special material, which receives its malleability from subsequent treatment, and is always easily recognized.

We may therefore say that the material available for making steel castings varies from the mildness and great ductility of wrought iron, up to the point where the iron is saturated with carbon, that is to say until there is so much carbon combined with the iron that it can contain no more, and any excess will remain as graphite, spoiling the ductility of the material and changing it to cast iron. As a matter of fact steel castings are never made to contain much carbon, that is to say the ordinary commercial steel castings, as they would not be suitable for any purpose to which steel castings are applied. About 5 to 6 6 1-10 of carbon is commonly the maximum limit of carbon in steel castings, and these are very hard, unless thoroughly well annealed. Castings can be made with as little carbon as .09 percent by the process to be dealt with later, and these may be described as wrought iron castings without slag. They are specially suitable for electrical purposes, where the material is required to have a very high permeability.

Processes for Manufacturing Steel Castings.

Steel castings are made by three processes in general, the crucible process, the open-hearth and the pneumatic, as represented by the Bessemer, or Tropenas. The crucible process is the most limited and expensive, limited by the capacity of the pots or crucibles, and expensive on account of their high cost, and the quality of the material that must necessarily be used. There is no refinement of the steel carried on in the crucible and it is merely a melting process, there are very small losses or variations caused, as the crucible is enclosed practically air tight, and the metal does not come in contact with the flame. On account of the absolute certainty with which different grades of steel can be made in the crucible, it is used for the manufacture of small castings of the highest grade, where the price is a secondary consideration. The castings are almost invariably sound, and of fine appearance.

The open-hearth process is undoubtedly the greatest process of all for the manufacture of steel castings. Its capacity is unlimited, it is easy to manipulate, the product is remarkably regular and it is cheaper than any other process. But even the open-hearth has its limitations, though they are not yet reached at the large end of the business. It is at the small end where the open-hearth finds trouble, and it must be said that it meets it very well under the circumstances. When the open-hearth tries to make castings below 100 pounds in weight it begins to become uneconomical, because if the steel is made as usual, it will not be hot enough to run the small castings, and if made hot enough it will ruin the furnace and the steel will in all probability rise out of the molds in a spongy mass. Very few small castings can be made at one heat with the open-hearth, and the balance must be put into large castings before it is too cold. Sometimes the small molds are brought up to the door of the furnace and a handle ladle is dipped into the bath and the castings poured in that way. This is very unsatisfactory, and therefore the open-hearth people give very poor deliveries on small castings, and fight shy of them as much as possible.

The Small Castings Field.

Here then is a wide open field with the following conditions to be encountered: To manufacture small steel castings of quality at least as good as the open-hearth with prompt delivery and low cost compared to crucible steel castings. At the same time the castings must be of good appearance and true to pattern, they must be sound and easy to machine.

The physical requirements when specified are from 60,000 to 75,000 pounds tensile strength, with not less than 15 percent elongation on two inches.

A cursory glance around the market will show that there is a practically unlimited demand for small pieces of every description, gears, pins, flanges, wrenches, links, brackets, lubricators, track repair tools, etc. They are manufactured largely at present in the form of drop forgings, brass, malleable, or gray iron castings, with disadvantage of cost, in case of drop forgings and brass castings, and of strength in gray or malleable iron castings.

It is well known that with the high speeds and pressures called for in modern machinery a material of great strength and lightness is required. The difficulty has always been to make a material practically identical with, or better than, open-hearth steel, to make it hot enough to be handled in small quantities and to run delicate sections. Above all the castings must be physically reliable, free from defects internally. The majority of small castings have very little machining done to them, and it is only possible to judge them from the exterior appearance.

*Read at the meeting of the New England Foundrymen's Association at Boston, Oct. 14, 1903.

NATIONAL ASSOCIATION OF AGRICULTURAL IMPLEMENT AND VEHICLE MANUFACTURERS' BANQUET

AT CLEVELAND, OCTOBER 22, 1903

SUPPLEMENT TO
THE IRON TRADE REVIEW
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How often a smooth and shining skin is but the covering of a mass of blow holes, which are only discovered when the piece fails in service, probably causing much trouble and serious loss. It must be remembered that in many small pieces one fair sized blow hole will practically cut the casting in two, and if it is a life line ring, a davit support, or other equally important part, there must be no chances taken.

Problems of the Steel Foundry.

But it must not be forgotten that a reliable material is not the only essential thing to make good steel castings. One of the most important elements of success is the design of the piece. It is impossible for a man to specialize along more than one or two lines, and therefore it is a matter more for regret than censure that more designers and engineers are not foundrymen or patternmakers. By the free exchange of ideas and information among these three branches of the business, much better results would be obtained at lower cost, as the risks and chances of failure would be reduced. The dangers from cracking, warping, segregation and internal shrinkage are possible of great reduction when the design, the pattern and the mold are made in accordance with the natural laws under which the material acts.

Apart from a correct design, suitable metal and good molding, the heat treatment that steel castings receive, and the thermal conditions under which they are made, exert a great influence on their strength, and it is only by a careful study of this subject that the best results can be obtained. The best material may be ruined by careless handling, and on the other hand wonderful results can be obtained from comparatively poor material. It is obvious that the best results can only be obtained when the metal poured into the molds is at a temperature suited to the weight and shape of the piece. It is a pretty safe rule to say that steel castings should be poured with metal as cold as possible, provided it is hot enough to run into every part of the mold. It is not difficult to get it cold enough, the trouble is to get it hot enough for the light work. There is an objection to the bottom pouring ladle system that must of necessity be used with the open-hearth, because you cannot see the condition of the metal nor the quantity in the ladle.

The matter of annealing is one which demands close attention. It is pretty safe to say that a great many if not a majority of the steel castings in use today are either under or over annealed. Annealing on steel castings is done for the purpose of relieving the internal strains due to shrinkage and to transform the molecular structure from the unnatural strained condition, due to comparatively rapid cooling. A microscopy slide prepared from an unannealed steel casting shows a crystalline structure, in which the size of the crystals depends on the temperature at which the metal was poured and the length of time it was allowed to cool. A sample cut from the same casting when properly annealed, shows practically an amorphous condition, the carbon which was before concentrated in certain localities is now evenly distributed and the casting is reliable. The result of annealing is to slightly reduce the ultimate tensile strength, but the ductility is very greatly increased, which means the casting will resist sudden shock. The writer has seen steel castings of normal chemical composition, and apparently of great strength, fly apart bodily when chipping off the fins, because the internal strains were so great that the slight addition of shock from a chipper's hammer was enough to rupture it.

One of the drawbacks to realizing the full value of furnace output is the necessity for putting large risers or heads on steel castings to supply the shrinkage. Steel shrinks considerably more than cast iron, and as it chills on coming into contact with almost anything, it is impossible to "churn" or "pump" it as is commonly done with iron castings. There is a fine opportunity and a fortune in sight for anyone who will find a means of making steel castings commercially without shrink heads, or even with smaller ones than must be used today.

The size of shrink heads can often be reduced by the exercise of good judgment in the method of molding, and it may be said that there is a great field for ingenuity in a steel molding floor. Steel molding, according to the writer's opinion, is a more highly skilled trade than iron molding, particularly the green sand branch. Variations in hardness in a steel mold work more havoc than they do in an iron mold, the sand being weaker is harder to work, and the venting must be more thorough.

The Sphere of the Tropenas Process.

Coming now to a study of the Tropenas process, we shall see what can be done to fill the vacancy mentioned earlier. While being exceedingly enthusiastic on the subject of the Tropenas process, and having had an intimate connection both with the process and its inventor since it was in its first experimental stage, the writer does not wish to be identified with anything that has been written, saying that the Tropenas process is better than the open-hearth, and so on. The idea is absurd on the face of it; it is like saying a spade is better than a steam shovel, because it can dig a smaller or a neater hole. In the field referred to earlier, the manufacture of parts that ought to be made in steel, but are made in brass or malleable, because of the difficulty in getting them in steel, the Tropenas process fills the bill entirely. It is the only one out of a great number invented that has stood the test of practical commercial application, and in over ten years' continuous use it has been proved to have great elasticity, meeting great fluctuations in condition of trade, and making castings from a few ounces to twelve tons. It makes steel so hot that the most delicate sections can be easily run and castings have been made after a portion of the steel has been in the ladle over two and a half hours. Lip pouring ladles are used almost exclusively, and the disadvantages of bottom pouring done away with. You can not only see how much steel there is in the ladle, but also if its temperature is suitable to the piece you propose to pour. There can be no competition between the Tropenas process and the open-hearth, because it cannot be denied that for the manufacture of large and medium castings the open-hearth process is unequaled. There should be, in the writer's opinion, as he stated in previous papers, a combination effected between the two, and every open-hearth furnace ought to have a Tropenas converter alongside of it, to take care of the small castings, and relieve the big furnace. It has been always the writer's endeavor to point out the special advantages and great economy of running the Tropenas system in conjunction with the open-hearth, as by means of that arrangement all anxiety as to delivery would be done away with, and the cost of running the Tropenas would scarcely be noteworthy.

The Tropenas process is a pneumatic system, that is to say the reactions are caused by a blast of air under pressure blown into the furnace. It is a modification of the Bessemer process, designed with the intention of producing an intensely hot, fluid steel, as free as possible from occluded gases.

The Converter and Other Equipment.

The furnace proper consists of a converter of the usual shape, the shell of which is made of sheet steel, and the lining of silica brick. It is mounted on trunnions, one of which is hollow, and acts as the wind connection between the blast pipe and the tuyere box, which is at the back of the converter. The converter is geared to an electric motor or compressed air motor, and has also a hand tilting arrangement, so that it may be rotated about its axis to meet the different requirements of charging, pouring, etc. The space occupied by the converter is about sixteen feet square, and the usual custom is to place it on the side of the foundry between two columns and pointing into a side bay where a stack pierces the roof and by means of a hood at its lower end collects all the gases, sparks, and smoke coming out of the converter mouth.

Alongside of the converter stands the cupola in which is

melted a mixture of low phosphorus Bessemer pig iron and steel scrap. The capacity of the converter is about two tons, and the cupola melts about five tons per hour, which keeps the converter supplied, as about two blows per hour can be made under good conditions. The mixture which is melted in the cupola is carefully calculated between certain limits and upon this and the subsequent handling of the converter depends success. After melting the iron in the cupola it is transferred to the converter by means of a ladle and there subjected to the action of a blast of air at about three pounds pressure per square inch, until all the undesired elements are oxidized and removed, leaving a bath of practically pure iron in the converter at an extremely high temperature.

Features of Operation.

It is to be borne in mind that no fuel is used whatever after the iron is once melted. The method by which this desirable result is reached is the Tropenas system of blowing. Extending through the side of the converter is a row of tuyeres which are placed exactly at the surface of the metal, or to be more correct it should be said that the amount of metal put into the converter is just enough to come up to the lower edge of the tuyeres, when the converter is in the correct position for blowing, which is at a slight vertical angle.

The arrangement of the tuyeres in the horizontal plane is such that the bath of metal cannot be agitated by the force of the blast, but remains as tranquil as possible throughout the entire blow. This constitutes the main difference between the Tropenas system and the Bessemer and all the other small converter systems which have had a meteoric existence during the last few years. It is an entirely different principle, for all other inventors have considered that the violent agitation of the bath was necessary to its complete purification. Tropenas proves that it is not only unnecessary, but harmful, because any system using submerged tuyeres has to use a high pressure of blast in order to keep the metal out of the tuyeres, and therefore blows in a much larger amount of air than is necessary for the chemical reaction. This is the cause of blowholes and sponginess, requires a much heavier blowing plant and all the excess air takes its share of the heat and goes up the chimney, without serving any useful purpose.

Auxiliary to the tuyeres just mentioned, and placed in a similar position at a distance of a few inches above the bath is another row of tuyeres which supply an amount of air which is entirely under control of the operator, and force it right into the center of the flame as it burns on the surface of the bath. The result is the same as in the Bunsen burner. The supplementary air completes the combustion and raises the temperature of the bath still higher.

The duration of the blow varies from 15 to 25 minutes, according to the composition of the metal treated, and during this time the sparks, flame and smoke emitted from the converter mouth are a clear indication to the trained operator as to the progress of the refining, and when the blow terminates by the dropping of the flame, showing that everything is burned out, he turns down the vessel, and shuts off the blast. He then knows that he has in the converters so many pounds of practically pure iron, and it is a matter of mental arithmetic to figure out how much ferro-manganese, ferro-silicon, pig iron or what not to put in to make steel of any desired composition. Control of composition is almost absolute with the Tropenas process, for you always start with a bath of practially pure iron and it is only a matter of putting in so many pounds of carbon, silicon and manganese. An experienced operator can do even better; the indications at the mouth are so clear that he can stop the blow before the carbon is all burned out, at almost any desired point he wishes, and the writer for four or five years operated a plant making from ten to twenty blows per day when this was done constantly, and the carbon range was from 0.10 to 1.10 percent. It is then only necessary to add silicon and manganese after the end of the blow.

One of the most noteworthy things in a Tropenas foundry is the ease with which the product is handled when ready to pour. Small castings are poured with the ordinary 100 to 150-pound bull ladles used in an iron foundry, and it is nothing unusual to carry it 400 or 500 feet, set it down, skim it off and leisurely pour ten or twelve snap molds, each containing probably 8 or 10 small pieces. It is by no means uncommon to pour 120 pieces with one bull ladle.

The castings possess a wonderful amount of ductility even without annealing, and castings of mild steel are frequently bent almost double without fracture.

THE HANGING ROCK REGION.

IRONTON, O., O ct. 26.—It is understood that furnacemen of this region are not as yet included in the plans for a curtailment of output, and all the furnaces aside from that of the Belfont Iron Works Co., which has blown out for extensive repairs, are in operation.

The large plant of the Ironton Engine Co., which has been retarded in construction on account of delays in the shipment of equipment, is now practically ready for operation.

The plant of the Foster Stove Co. in this city, which has been entirely rebuilt and is now the largest of its kind in this section of the valley, will start up in a few days for general work. Some delay has been caused in the finishing department by a strike of the nickelers, who demand an increase of about 20 percent, which the company has declined to grant.

The Marting Iron & Steel Co., the Richey Iron & Steel Co. and the Kelly Nail & Iron Co., have recently sold to the Toledo & Ohio River railroad a right of way through their respective properties in Ironton.

The management of the Portsmouth Steel Co., of Portsmouth, O., confirms the consolidation of that company, the Whitaker Iron Co. and the Wheeling Corrugating Co., of Wheeling, and the Laughlin Nail Co., of Martins Ferry, with a capital of about $10,000,000. The consolidation is for the elimination of expense, it is said, as practically the same men control the stock in all the concerns.

Regarding a report that the Burgess plant of the Portsmouth Steel Co. was to be closed down, Supt. Knowles said last week: "The rumors are without foundation. Improvements are constantly in progress. It is true that three furnaces are idle just at present, but this is due to the fact that the mill is overstocked with ingots and billets. As soon as this stock is worked up the furnaces will resume. We have plenty of orders ahead and at present I see no reason for ordering a suspension."

At the annual meeting of the stockholders of the Ashland Coal & Iron Railway Co., and the Ashland Coal & Iron Co., at Ashland, Ky., Oct. 21, the resignations of Col. Douglas Putnam, president; D. Gray Putnam, general manager; William N. Mayo, master of transportation, and Mr. Kelly, superintendent of mines, were accepted. The new board of directors elected for both companies is as follows: K. L. Butler, Joseph Butler, and John Winslow, of Cincinnati; Col. Robt. Peebles, Col. Frank Coles and W. B. Seaton, of Ashland. The new directory elected the following officers: Robert Peebles, president; Frank Coles, vice president; K. L. Butler, second vice president; Frank B. Moore, secretary-treasurer; A. N. Richardson, auditor. The election is the result of the recent coup of Col. Peebles in securing the controlling interest in the concern and it is current report that both the C. H. & D. and the Detroit Southern are bidding for the property, which is desired as a connecting link in the plan to enter the West Virginia and Kentucky coal fields and eventually to put through a route from the lakes to the southern Atlantic coast. The C. H. & D. is now in control of the bridge rights between Ironton and Ashland and under the name of the Ironton & Ashland Bridge Co. has incorporated with a capital of $1,200,000 to construct the bridge, the approaches and rights of way having been partly attained during the past few weeks.

KIRKWOOD OIL SYSTEM FOR MELTING FURNACES.

When a manufacturer considers the installation of any melting furnace using crude oil as a fuel, he is immediately confronted by a number of serious problems, as the insurance companies have placed restrictions about the using and handling of crude oil which make it necessary to be very careful as to the style and design of apparatus used for handling it. Tate, Jones & Co., Inc., of Pittsburg, have installed their Kirkwood fuel oil, pumping and regulating system in connection with the Schwartz melting furnace in a number of places. This is illustrated in Fig. 1, where the system is shown applied to a

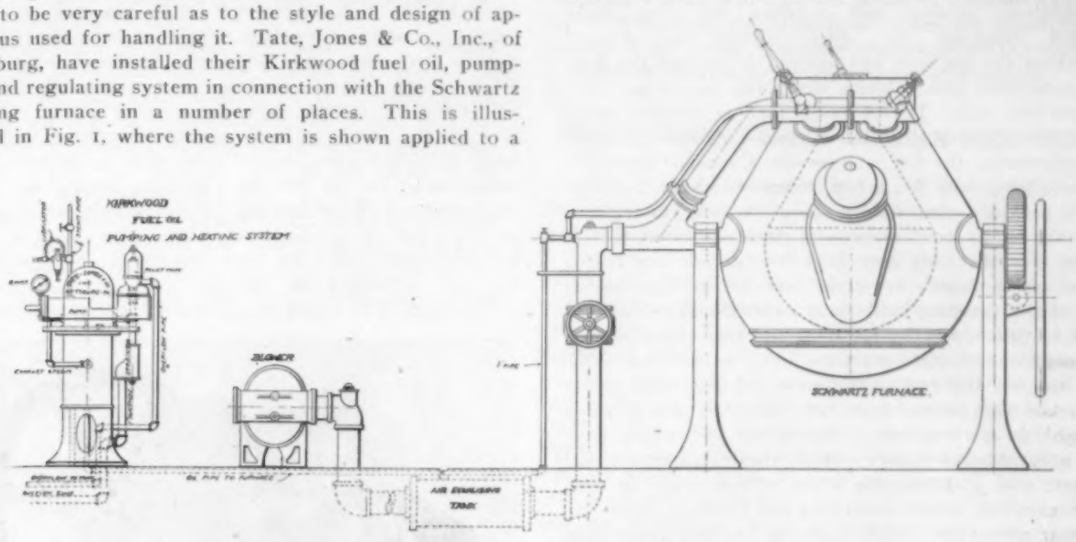


FIG. 1.—KIRKWOOD SYSTEM APPLIED TO SCHWARTZ FURNACE.

Schwartz furnace. The oil is fed to the burners under a carefully regulated constant pressure, and is heated before delivered to the burners. Provision is also made to insure the fact that the oil is free from lumps and foreign substances. The Kirkwood mechanism is absolutely leak proof, thus complying with insurance regulations. In Fig. 2 the Kirkwood apparatus is shown separately from the furnace. This fuel oil system is in daily use with good results at the H. K. Porter Locomotive Works, Allegheny, Pa., Pittsburg Valve & Fittings Co., Barberton, O., and a number of other plants.

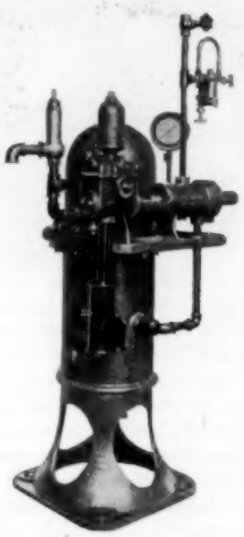


FIG. 2.—THE KIRKWOOD APPARATUS.

An officer of the American Car & Foundry Co. states that the company has not canceled a single contract; that it is not in the need of money, as it had at the close of last week $2,300,000 in bank; and that it has earned in the first four months of the current year the full dividend for the year on its preferred stock. While the present business will not equal that of the abnormal business of a year ago, there has been no very large decrease, and the indications are that the business for some time to come will be in fair volume and fully remunerative.

STEEL RAILS AT A COST OF $12 A TON.

Quoting a statement from the New York *Tribune* as its text, the *Bulletin* of the American Iron and Steel Association comments on the recently published quotation from a letter said to have been written on May 15, 1899, by Charles M. Schwab to H. C. Frick. This letter was to the effect that the Carnegie Steel Co. could make steel rails at less than $12 a ton and thus could make a profit by selling export rails at $16 a ton. The *Bulletin* says in part:

"In its synopsis of Mr. Schwab's alleged letter the *Tribune* says that Mr. Schwab said that the Carnegie Steel Co. could make rails at less than $12 a ton and ship them abroad so as to net $16 at the works for foreign business.' There is nothing remarkable in this statement if Mr. Schwab made it. If he did make it he must have meant that the expense to the Carnegie Steel Co. on May 15, 1899, of merely providing, assembling, and converting the raw materials required to make a ton of steel rails and rolling the resultant ingots into rails was 'less than $12 a ton,' while the company could afford to sell these rails 'for foreign business' at $16 'net at the works.' As contracts for steel rails were still running 'below $20' in May, 1899, according to the *Tribune*, the net price of $16 at the works for rails to be sent aboard was not unreasonably low at the time mentioned when we consider the efforts that were then being made by our railmakers and other iron and steel manufacturers to capture foreign markets. We did not realize early in May, 1899, that this country was then entering upon a boom that would tax to the utmost our facilities for the manufacture of iron and steel, nor did we then realize that the cost of the raw materials required in the manufacture of these products and of the labor employed would soon be increased very far beyond the prices and the wages that were then prevailing. It may be safely assumed that Mr. Schwab would not in June, July or August, 1899, or at any subsequent time during the last four years, have advised anybody that the Carnegie Steel Co. could make steel rails at 'less than $12 a ton,' or at a cost anywhere near these figures, and we are quite sure that he did not ship any steel rails abroad after May 15 of that year which netted only $16 at the works. He could not afford to do it.

"But could Mr. Schwab in May, 1899, when the alleged letter was written, produce steel rails at the works of the Carnegie Steel Co. at the low cost above mentioned? Assuming that the company then owned all the necessary sources of supply of the raw materials that were required to enable it to make steel rails, or nearly all, together with the transportation equipment that was needed to bring these raw materials together, could it at that time

assemble them and convert them into steel rails at a cost of $12 a ton?

"The answer to this question must depend on what is meant by the little word 'cost.' If Mr. Schwab made the statement attributed to him he doubtless considered only the expense to the company in wages or otherwise of mining and shipping the iron ore, quarrying and shipping the limestone, mining and shipping the coal, making and shipping the coke, piping the natural gas, making the pig iron and passing it through the Bessemer converter, and breaking down the ingots and rolling them into rails. It is possible that, at the time mentioned, when wages were lower than they were a short time afterwards, the net cost to the Carnegie Steel Co. may have been only $12 a ton, computed as we have indicated, provided that in obtaining its raw materials it drew only on its own sources of supply. But it will at once be seen that this cost does not include any return for the vast amount of capital invested in the various plants of the company and in its railroads and lake vessels, or any allowance for the wear and tear of machinery, office expenses, taxes, insurance, etc., or for the value of the iron ore and coal in the mine, the limestone in the quarry, and the natural gas—raw materials which when consumed do not reproduce themselves but which have cost a great deal of money. If all these elements in the aggregate cost of producing a ton of steel rails be considered, even the severest critic of the Carnegie Steel Co. or of our protective policy must in fairness admit that Mr. Schwab's statement, if he made it, should not be too literally construed. From a bookkeeper's point of view it may have been correct, but from any other point of view it was fallacious. The alleged mention by Mr. Schwab of a price for steel rails 'so as to net $16 at the works for foreign business,' or $4 above the alleged cost, of itself shows that in his $12 statement, if he made it, Mr. Schwab took only the bookkeeper's views. 'Foreign business' in those days was sought at the lowest prices that would cover all the costs of production.

"Having frankly considered that phase of the alleged letter of Mr. Schwab which has so strongly aroused the indignation of free trade editors, we turn for a moment to a subject of much boarder scope but one which free traders never mention—the great benefits which this country has derived from the building up of our wonderful steel rail industry. Through the enterprise, the courage, and the business sagacity of a few patriotic citizens, who are condemned by free trade editors as if they were public enemies, the manufacture of steel rails in our own country instead of in some other country has made it possible, through the abundance of the supply of rails and the cheapening of prices, to build thousands of miles of railroad that could not otherwise have been built, develop valuable resources of the country that could not otherwise have been developed, and cheapen the cost of transporting the necessaries of life that could not otherwise have been cheapened. What matters it if some of the men who have built up this great home industry have made money? They have well earned the money they have made, for they took great risks and are still taking them. While doing this they have manufactured and sold during the last five years of the most extraordinary boom in all business that this country has ever known over thirteen million tons of Bessemer steel rails at an average price of less than $29 per ton, a far lower price than foreigners would have charged us. These men have been public benefactors. The railroad companies never complain of the prices they have to pay for steel rails. Why should the free trade editors?"

Robert Scannell, of Cleveland, has obtained a patent on a metal polishing compound. The mixture will be serviceable for brass and similar alloys and consists of tripoli, oxalic acid, common salt, carmine and water in the following proportions: Two and one-half pounds of tripoli, one and one-half ounces of oxalic acid, one pound of common salt, one-quarter ounce of carmine and eight or ten ounces of water.

OPEN-BACK PRESSES WITH NEW FEATURES.

A new line of presses made by the Consolidated Press & Tool Co., of Chicago, comprises six sizes ranging in weight from 3,000 to 22,000 pounds and with all the special patented features embodied in the regular line of inclinable open back presses built by this company. These devices comprise the following: Self-oiling bearings for shaft journals; compensating ball joint connections; solid connection sleeve with only one jam nut; sleeve and jam nut move together when adjusting connection; both gibs are adjustable for taking up wear; positive safety stop, so that press cannot make a second revolution until the latch is pulled clear down; new style cushioned latch, which takes the jar off the clutching mechanism; automatic safety lock for locking the clutch bolt, while setting dies (no set screw to adjust); a new style latch bracket; a compression spring for returning treadle, with provision for easily adjusting the tension.

The shaft is of tough steel, forged, and is made larger,

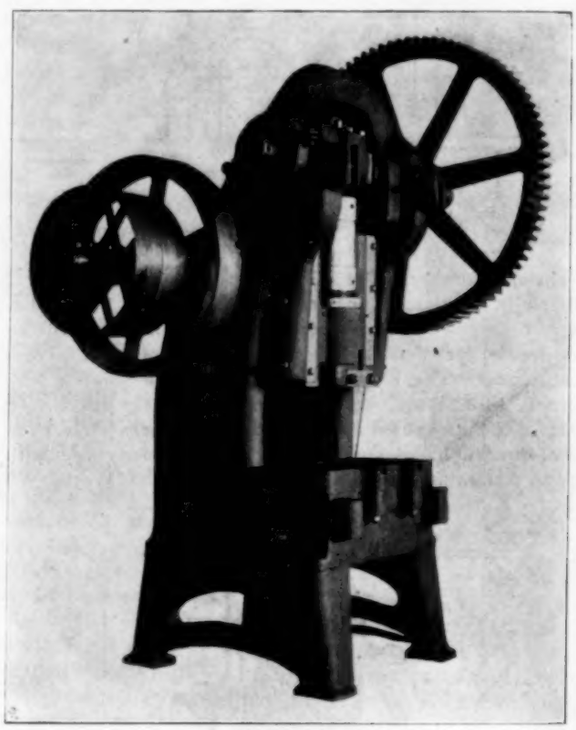


FIG. 1.—A NEW PRESS.

particularly in the connection bearing, than on equal weight presses of the usual construction.

The compensating ball joint connection with solid sleeve is new, having one jam nut only, which is fastened to the sleeve in such a way that the two move up and down together after the jam nut is loosened slightly. This construction is said to be superior in practice to the double screw with two jam nuts or the split sleeve with pinch bolt. The objection raised to the former is the time consumed in adjustment, owing to the necessity of moving three distinct pieces each time and of jamming the two nuts after the change is made. The split sleeve was also discarded, the designer fearing a liability to break when subjected to a heavy strain, owing to the uneven bearing of the threads of the sleeve on the screw when clamped. The ball joint when properly fitted is held to be a better joint, the difficulty heretofore in applying this device to presses being the lack of provision for easily taking up the wear. This has been met in the compensating ball joint. The ball proper is larger in diameter than usual and is made from a forging, the seat in the slide being carefully fitted with special tools designed for this work, the ball being held in place by a solid nut (instead of a split plate held with cap screws) so arranged as to allow for taking up any possible wear by loosening two small

screws and tightening up the nut. The connection can be readily taken apart without removing the slide from the press or disturbing the adjustment of the gibs. The nut which takes the strain (the sleeve acting only as a distance piece) is made from a forging carefully fitted to the screw, the thread being a special one, intended to prevent stripping or crumbling even when subjected to the heaviest service.

The connection is adjusted by means of a spanner wrench, so made that pressure can be applied in one direction only, the strain coming on the outside of the sleeve or nut and not on the sides of the holes, as is the case where an ordinary starting bar is used. This feature does away with the breaking down of the walls of the holes in the nut and sleeve.

The clutch consists of a square bolt located in the shaft collar parallel to the shaft, the bolt being actuated by a spring at end, so that when pressure is applied to the treadle the bolt engages the fly-wheel, causing the shaft to

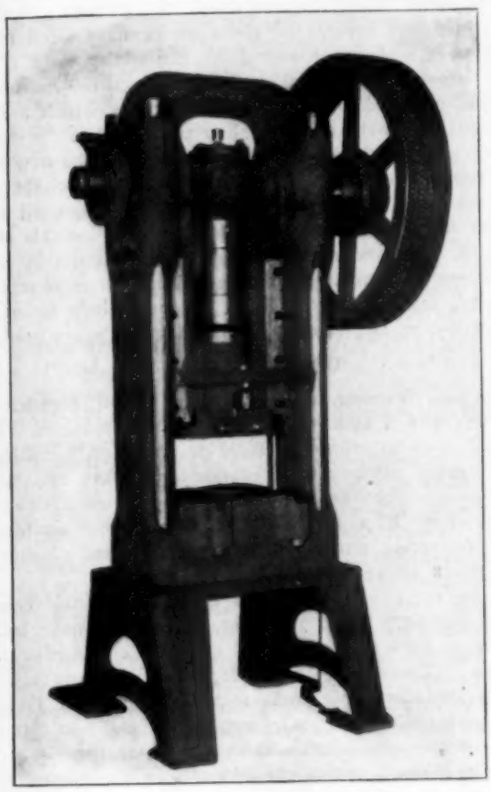


FIG. 2.—ANOTHER EXAMPLE OF RECENT PRESS DESIGN.

rotate continuously until the foot is removed, then the latch disengages the clutch bolt and the shaft stops automatically on the up-stroke. This style of clutch is old in principle, but a number of changes have been made. It is provided with a safety lock which enables the operator to lock the clutch bolt securely in the collar by giving a knurled-headed bolt a half-turn, so that it is impossible to engage the clutch by applying pressure to the treadle, or to unlock the clutch bolt after it is locked and the shaft moved, until the shaft is turned back to the up-stroke when the latch relieves the pressure on the lock, permitting the operator to release it instantly. This feature makes it possible to set dies speedily and with perfect safety without throwing off the belt.

The fly-wheel has three clutching points, the wheel pins being extra large and slotted to receive the clutch bolt, thus acting not only as a striking pin but as a locking pin as well, preventing any backlash or rebound when operating combination dies.

The latch is a straight piece of tool steel extending back and at right angles from the shaft, the rear end being cushioned. This form of latch permits the placing of the supporting bracket directly back of the shaft and fastened to the press frame by two bolts, one on either side of the latch, the strain coming directly on the bolts.

The latch is provided with a positive safety stop so that the press cannot "repeat" or make a second revolution unless the latch is pulled clear down. The spring for returning the latch is in a pocket or barrel, forming a part of the latch bracket, means being provided for adjusting the tension of the spring, a feature which enables the operator to maintain the treadle spring at a uniform tension.

DISCRIMINATION AGAINST AMERICAN TOOL STEEL.

United States Ambassador Meyer, of Rome, Italy, made the following report to the State Department in June, which was made public this week:

"Raphael H. Wolff, general agent of the Crucible Steel Co. of America, called my attention to an alleged discrimination at the Italian custom houses against importations of American tool-steel bars. These bars are sent to Italy with a slight coating of cheap varnish to prevent them from rusting on the sea voyage, and the Italian officials recently decided that this application of varnish was an advanced state of manufacture. The duty was therefore increased from 6 francs ($1.16) to more than 12 francs ($2.32) per 100 kilograms (220.46 pounds), while English and German bars, not so varnished, were admitted at the usual rates. I wrote to the minister of foreign affairs on April 11 last concerning the alleged injustice. The minister, in his reply, is willing to consider the question as soon as another test case is presented."

The European agent of the Crucible Steel Co. of America, J. C. Gutmann, Esq., in writing further to Ambassador Meyer about the matter, says:

"The customs controversies were all regularly made on arrivals of the goods. The first, in August of last year, for bright rolled steel, greased, was decided by the Collegio dei Periti to my disfavor, and the steel in question, which was of a common quality, had to pay 11 lire per 100 kilograms ($2.12 per 220.46 pounds)—*i. e.*, about one-third of its value. Another controversy which I made on the 30th of March last for another lot of steel varnished against rust is still pending, and I beg to inclose copy of my answer to the Collegio dei Periti. Here I beg to draw your attention to the following facts: Until about one year ago all the steel, whatever was its exterior, paid 6 lire per 100 kilograms ($1.16 per 220.46 pounds) duty, and I received hundreds of tons at this rate without there having been the least difficulty. Since that time, however, the custom house officers seem to have been discovering reasons for putting steel in the highest possible class. In all cases the objections, it seems to me, are contrary to the sense of the customs tariff. The difference in the duty is so considerable that many kinds of steel—as, for instance, the above-mentioned rolled steel—are inhibited from further importation into Italy. In the controversy of March 30 the duty of the custom house officers assessed is exactly two and one-half times as much as it ought to be—*i. e.*, 15 lire ($2.90) instead of 6 lire ($1.16). An early settlement of the matter is the more desirable as a considerable quantity of American tool steel is lying in the port of Genoa awaiting decision in the important question."

In presenting his contention to the Italian customs officers, Mr. Gutmann said:

"I maintain that the preparation which is found on the surface of the steel bars is only an antirust preparation, which disappears upon contact with fire, and not a varnish in the sense of the definitions of the customs list; the point of view of which certainly is that varnish increases the value of merchandise. This is steel for tools, is rolled, beaten, and polished in every way according to the kind of tool it is desired to make, and, consequently, the antirust does not increase the value at all."

The Mills-Gorman Foundry Co., Bridgeport, Pa., recently organized, has taken over the MacGregor foundry which has been in operation nearly two years. The building will be enlarged, new equipment added and the capacity of the works increased.

ELECTRIC EQUIPMENT AT PUEBLO.

In the current issue of *Camp and Plant*, published under the auspices of the Colorado Fuel & Iron Co., is the following interesting article by W. K. Frendenberger on the equipment of the electrical department of the company's Minnequa works at Pueblo, Col.:

The rapid increase in the last twenty-four months in the use of electric motors for driving all kinds of machinery in the Minnequa Works of the Colorado Fuel & Iron Co. at Pueblo, Colorado, has been remarkable. Two years ago the power house contained only two small generators, the combined horsepower of which was less than 375, and the current from which was used principally for lighting the plant; very little being left available for running motors.

New Power House.

The new power house now contains five large generators and one air compressor. Three of the generators are direct current machines. They operate at 240 volts, have an output of 670 horsepower each, and are used exclusively for operating motors for driving machinery in all parts of the works. The other two generators are three phase, alternating current machines. These generate current at 2,200 volts and have an output of 535 h. p. each. This high voltage is very dangerous, so the wires carrying the current are placed on the very top cross arms of the electric poles and run to transformers which are located where the current is to be used, and which reduce the voltage to 110 volts. At present these two machines are used exclusively for lighting the plant. The air compressor is large, being cross compound, 18x36x30. It furnishes compressed air power for use in the shops and foundry, for riveting, drilling, etc.

The use of electric motors has now become so general and the works are so dependent upon electric power that every department in the plant would be shut down in case of a serious accident to the generators. For this reason it is absolutely necessary always to keep one spare generator, so that when a breakdown occurs on one machine the remainder will be able to carry the load until repairs can be made.

To get an idea of how and where this current is used let us consider each department in turn, first turning our attention to the blast furnaces.

Blast Furnace, Steel Works and Shops.

In the old-fashioned way, the work of getting the ore, coke and limestone to the foot of the blast furnace, ready to be charged, required from twenty-five to thirty men for each furnace. By using electric trolley cars the same work is now accomplished by two men. Each of these cars has a capacity of 10 tons and is operated by 2 15-h. p. motors.

These charges from the trolley cars are dumped at the foot of the furnace into a larger car, which is hoisted to the top of the furnace by means of a cable and drum operated by a 150-h. p. electric motor.

In this operation of taking the materials from the bins to the 4 large furnaces and hoisting them to the top, 22 motors are required, having a combined capacity of 870 h. p. The blast furnaces have also a 40-ton 4-motor overhead electric traveling crane in each engine house for handling the heavy parts of the engines in erecting and repairing. Twenty ton electric cranes also span the cast houses of two of the furnaces.

Most of the machines in the old merchant mills were driven originally by small steam engines, but because they were too far away from their boilers to get dry steam and for other causes they did not prove satisfactory, soon wore out, and have been gradually abandoned, scrapped and replaced by motors. Not one of these small engines remains, while 25 motors in sizes of 5, 7½, 15, 25, 35 and 50 h. p., aggregating a total of 380 h. p., operate shears, straightening presses, cold saws, hot saws, fans, punches, a small crane and other machinery in this department. These 25 motors are cared for by one man, who also has a number of other motors to look after. The facts worth noticing particularly in this connection are these: Extremely low cost of attendance, low cost of repairs, and few delays, with the use of motors, compared with the same items when engines are used. The modest motor, hid away in a small space, out of view, runs along day after day doing its work noiselessly and efficiently.

Formerly the machine shop was driven by a 175-h. p. engine which required the attention of two engineers, one for the day turn and one for the night. More than a year ago this engine was replaced by 4 35-h. p. motors These motors require the attention of one man for less than half an hour in each period of 24 hours, and have not given any trouble, nor cost anything for repairs in the entire year. In the roll shop an engine of the same size was replaced by a 50-h. p. motor—less than one-third the capacity of the engine. Aside from accidents due to pieces of iron flying into the motor it has run along without any trouble. One 50-h. p. motor drives the carpenter shop, 1 35-h. p. motor drives the pattern shop, 1 25-h. p. motor drives the pipe shop. It has been at least a year since any repairs of consequence have been made on these 3 motors, or any delay caused by them. The other important electrical equipments in this department are the overhead electric traveling cranes which are so indispensable in the machine shop and foundry.

The fact that the engineers who designed the new east mills used motors in every place where motors could possibly be used is proof that it is now recognized that motors are more economical than engines for this class of work. Of course this applies only to units in sizes of say less than 200 h. p. In the rod mill alone 26 motors are used, aggregating 675 h. p. In the 40-inch blooming mill 12 motors, aggregating a total of 535 h. p. are used.

Other Departments.

The pipe foundry uses a 35-h. p. motor for driving a blower and a 15-h. p. motor on a hay machine. The rail mill uses 25 motors, a total of 270 h. p., for driving straightening presses, drill presses and other apparatus. The Bessemer converter and bottom house use 11 motors, a total of 665 h. p., for driving fans and other machinery at the converter, and for driving the fans and crusher at the bottom house.

At the open-hearth furnaces the large electric cranes are interesting. The 2 75-ton cranes which handle ladles holding 50 tons of molten steel are each equipped with 5 motors. These motors are larger than crane motors usually are, one being 75 h. p. and two 50-h. p. in size. The seven cranes and two charging machines in this department use 1,060 h. p. in motors to drive them.

The two small generators formerly in the main power house are installed at the wire mill and furnish current for motor power there. As originally planned it was not intended to use motors for driving machinery at the wire mill; but they have been found so useful that one after another has been added there, until now eleven motors, a total of 230 h. p., are in service.

In all departments more than 180 motors are in use for driving machinery, their total rated capacity being 4,600 h. p.

The 66 electric traveling cranes on the plant use even more power than the motors driving other machinery. The cranes use 220 motors with a total rated capacity of 7,000 h. p.

As stated before, the two 535-h. p. alternating current generators are used exclusively for lighting. They have been in operation only a short time so that not all the lighting load has been transferred to them. A large part of the lighting is done with enclosed arc lamps. There are more than 300 of these now on the plant. Some 270 h. p. is required to operate them. About 2,700 16-candle power incandescent lamps requiring about 200 h. p. are also on these machines, making a total of 470 h. p., a good load for one generator.

A mill telephone system was installed about two years ago with a central at the main office. Immediate com-

munication is thus established between the main office, hospital and plant. The switchboard has 100 drops and is designed to accommodate 100 'phones, each on a separate pair of wires. Two lead-covered cables run from the main office to the plant and carry 75 pairs of wires for these 'phones. Seventy-eight 'phones are already installed and in constant use, operators being on duty throughout every day and night.

No Age Limit at British Steel Works.

The following paragraph from an English exchange is reprinted to call attention to the impossibility of such a chronicle in the United States. A managing director at 87, or within 25 years of that age, is unknown in a country in which men come to the presidency of steel companies with tens and hundreds of millions of capital before the turn of 40:

"The death took place at Dunfermline, on Sept. 16, of Mr. Andrew Landale, managing director of the Lochgelly Iron & Coal Co. (Lim.). The deceased, who was eighty-seven years of age, began life as a colliery manager in the Lothians, and in 1850 went to Fife as manager of the Lochgelly Iron Co.'s works."

Old men on the directories of British steel companies or in managerial positions are more of a factor in the so-called conservatism of the British iron industry than some other things on which more stress is laid.

Property Rights in Blue Prints.

Judge McFarlane, of the Allegheny County common pleas court, sitting in Pittsburg, has decided that it is illegal for an employe to retain or appropriate blue prints of a concern after leaving its employ. The decision was made in the case of the Pressed Steel Car Co. against J. M. Hansen and others connected with the Standard Steel Car Co., of Butler, Pa. The decision of the court is in part as follows:

"The Pressed Steel Car Co. is the owner of and entitled to the possession of all blue prints, tracings or drawings and all copies thereof of cars or car parts designed for cars built or intended to be built by the Pressed Steel Car Co. and now or at the date of the filing of the bill in this case in the possession of the defendant, the Standard Steel Car Co., or in the possession of its officers, employes, agents or servants, including what has been known in the trial of this case as secondary prints, and that the same be delivered by said Standard Steel Car Co. to the Pressed Steel Car Co. in the manner provided in this decree. And it is further ordered that the said defendant, the Standard Steel Car Co. shall deliver unto the plaintiff, the Pressed Steel Car Co., all other blue prints, tracings or drawings and all copies thereof, of cars or car parts, designed for cars built or intended to be built by the Pressed Steel Car Co. now or at the date of the filing of the bill in this case in the possession of the said defendants. That the defendants be restrained and enjoined from taking, obtaining, copying or using any blue prints of cars or car parts made by or for the Pressed Steel Car Co. and designed for cars built or intended to be built by that company. That the defendant, Culverhouse, having surrendered certain bills of material taken by him from the office of the plaintiff company, it is ordered that the prothonotary, in whose custody the said blue prints of bills of material have been placed, shall deliver the same to the plaintiff."

The Republic Iron & Steel Co. re-elected its old board of directors at its annual meeting last week. The directors are G. Watson French, Harry Rubens, John F. Taylor, Alexis W. Thompson, and Charles H. Walker. The officers were also re-elected.

For the alleged breach of a contract to supply coke during the famine last winter, the Iroquois Iron Co., Chicago, has filed a suit for $250,000 against the H. C. Frick Coke Co., of Pittsburg.

RUSSIAN IMPORTS OF IRON AND MACHINERY.

The following has been condensed by the Bureau of Statistics at Washington from a report by the German consul at Riga, Russia:

Iron.—Russia's iron imports in 1900 were 3,200,000 poods (57,830 tons of 2,000 pounds); in 1901., 1,800,000 poods (32,530 tons); in 1902, 1,100,000 poods (19,880 tons). Much of this went into the Empire by way of Riga. In recent years Riga is seeking her supply of raw iron in the iron mills of Russia. The kinds that come into the Riga country, by way of its harbor, are especially prepared irons—particularly charcoal iron. Twenty-eight and eight-tenths of Russia's importations of raw iron reach her by way of the Empire's Baltic ports. The importation of iron in bars, rods, plates, etc., amounted in 1899 to 15,900,000 poods (287,350 tons); in 1900, 5,700,000 poods (103,012 tons); in 1901, 5,300,000 poods (95,783 tons); and in 1902, 3,700,000 poods (66,867 tons). The falling off in bar iron was from 8,059,000 poods (145,644 tons) in 1899 to 1,145,000 poods (20,693 tons) in 1902; in iron plates, Nos. 25, Birmingham caliber, from 6,102,000 poods (110,277 tons) in 1899 to 1,058,000 poods (19,121 tons) in 1902; in plate irons above Nos. 25, from 1,757,000 poods (31,753) tons) in 1899 to 1,526,000 poods (27,572 tons) in 1902. The larger part of this trade was once in the possession of Germany. The falling off is put down to Russia's protective tariff and to the constantly improving character of the iron produced in Russia.

Steel.—The importations of steel were 2,374,000 poods (42,904 tons) in 1899, 1,111,000 poods (20,078 tons) in 1900, 795,000 poods (14,548 tons) in 1901, and 718,000 poods (12,976 tons) in 1902. The falling off in steel bars, rods, etc., was from 1,898,000 poods (34,300 tons) in 1899 to 586,000 poods (10,590 tons) in 1902; in sheet steel, up to Nos. 25, from 423,000 poods (7,657 tons) to 110,000 poods (1,990 tons); for numbers above 25, from 53,000 poods (958 tons) to 22,000 poods (398 tons). Here, again, the enterprising spirit, intelligent activities, and imitative faculties of the Russian people are reaping their usual reward. England and Germany are the sufferers.

Iron and steel rails.—The rails and railroad material imported into Russia in 1899 amounted to 746,000 poods (13,482 tons); in 1900, to 304,000 poods (5,494 tons); in 1901, to 81,000 poods (1,464 tons); in 1902, to 55,000 poods (994 tons). Here is a falling off that means the ultimate extinction of this line of imports. The reason assigned for this decline is the Russian government's regulation or ruling that all material used in the public works of the empire must be home made.

Machinery.—The total importations of machinery were, in 1899, 11,800,000 poods (213,253 tons); in 1900, 8,700,000 poods (157,229 tons); in 1901, 6,000,000 poods (108,434 tons); in 1902, 5,600,000 poods (101,205 tons). In the year 1902 3,600,000 poods (65,060 tons) went in for manufacturing and 1,800,000 poods (32,530 tons) for agricultural purposes; in 1901 the amounts for these purposes were 3,400,000 poods (61,446 tons) and 1,600,000 poods (28,915 tons), respectively. Complicated agricultural machinery still finds a market in Russia. Germany has had a large part of the trade in machinery. In 1902 her share was worth 24,000,000 rubles ($12,360,000). In the order named followed Austria, Hungary, the United States, Sweden, Belgium, and France. In agricultural machinery Germany still leads and is followed by Sweden and Great Britain. Of the imports of machinery for manufacturers Great Britain supplies two-thirds and Germany one-third.

An official report to the Austrian Government says that steel is playing a more and more important part in the Baku regions of Russia. During recent years the importations of steel wire ropes diminished steadily. This was due to the erection of works in that part of Russia. The city of Baku has established two in the last two years. Cable chains for tank steamers are all imported, mostly from Great Britain, which practically controls the market, Austrian works being unable to compete with British producers.

Frederick Proudfoot, of Winnipeg, Man., is reported to have sold an iron mine on Black Island, in Lake Winnipeg, to an American syndicate for $60,000.

ACCIDENTS TO ELECTRICAL MACHINERY.

The recent report of Michael Longridge, chief engineer of the Engine, Boiler and Employers' Liability Insurance Co., England, has some account of various accidents to electrical machinery and a number of these are of quite general interest to owners of a rapidly increasing type of factory equipment. An open type, two-pole, underhung dynamo was run at 430 revolutions per minute. While the machine was at work a wood screw, one inch long, got between a magnet pole and the armature, cutting the insulation and short circuiting several of the wires. The manner in which the screw got to the machine was not known with certainty and there were no screws of the kind used near the dynamo. It may have been pulled out of a workman's pocket with a handfull of waste, have fallen unnoticed on the floor and rolled or been kicked under the machine. A piece of wire gauze was later fitted across the gap between the lower horns of the pole pieces. Another case was that of a two-pole dynamo of similar type and run at a speed of 700 revolutions per minute. A small wrench carried carelessly near the machine was drawn against the armature and short circuited some of the conductors.

An instance is given of the failure of a dynamo which was used alternately for lighting and charging a storage battery. The armature was short circuited by reason of the breaking down of the insulation and several of the wires were completely burnt through. The dynamo stood close to a door leading into the battery room and the acid fumes from the battery had destroyed the cotton covering of the conductors. The corrosion would not have been so certain if automatic doors had been placed between the two rooms or some such method applied of preventing the fumes from entering the dynamo room.

Some of the electrical troubles were due to faulty erection or construction of the machine and on this account were not to be charged to those in control later. An instance of the former was in the case of a motor having the main cables and brush leads connected to brass terminals. The terminals were screwed into wood plugs driven into the magnet yoke. The yoke became short-circuited to one of the terminal screws and an examination showed that the threaded end was burnt badly and the wooden plug charred. The point of the screw had been so near the iron of the yoke that the increased pressure had forced the current across the gap or the plug had been gradually carbonized by sparking and had become a sufficiently good conductor to carry the current under the severe pressure from terminal to yoke. The current in this case was supplied by a three-wire system which had a grounded middle wire and the frame of the motor was also earthed. A similar case developed with a 3-h. p. portable motor in a shipyard. A terminal screw put in to carry a fuse, projected through the slate base and touched the motor frame.

These are characteristic of the troubles from faulty erection but there are others which come nearer to the designer. An armature was found rubbing against the pole pieces, an investigation following the blowing of a 48-ampere fuse, the motor being rated to take 35 amperes at 400 volts. Examination revealed a fracture of the armature shaft at one of the grooves cut to prevent the passage of oil along the surface. The groove, though less than 1-16-inch deep, was sufficient to start a fracture which gradually extended across the shaft and practically at right angles to the axis. "This is a typical case" says Mr. Longridge, "and is mentioned in the hope that it may induce manufacturers to refrain from introducing such an obvious source of danger into their designs. What would be thought of an engineer who deliberately cut such a notch in each rail laid down to carry traffic on a railway?"

The breaking of the commutator ends of the armature coils on a 4-h. p. crane motor was in the same class. The armature, on being taken down for repairs, showed that the spider was carried on a gun metal sleeve threaded on the shaft, and both sleeve and spider were held against a collar by a nut, the friction of nut and collar being relied upon to prevent the armature turning on its shaft. The slackening of the nut had freed the armature and thrown the strain upon the connections at the commutator.

The report tells of instances of the wear of steel by a softer metal, which have come under the notice of the company during the year. One of these is in the case of a two-pole motor. This was a 2-h. p. machine at 1,800 revolutions per minute and was 3½ years old. The motor on being started up one morning surprised the attendant by a rotating armature at the same time that the pulley on the end of the shaft remained stationary. The shaft had broken in the bearing at the pulley end, a groove had worn in the shaft deep enough to cause the break. The fracture took place where the ring oiler was located and had apparently been caused by the brass ring. The ring was found to be in good condition and free from wear. A sample of the oil was obtained and analyzed to ascertain whether it contained an acid which might have an injurious effect upon steel but none was found.

A number of cases where improper connections have been made from dynamos to motors are described. One of these had the rheostat short circuited across the lead wires and the motor and resistance switch were installed by the workman in charge of them afterwards. He acknowledged to the inspector that he could not see the use of the rheostat but "it had to go somewhere." Pendants touching gas pipes, connections to wrong ends of rheostats, thin brushes on commutators, loose and broken wires, imperfect contacts in switches, etc., contributed to the inspector's anxieties according to the report.

Larger Output with Night Force Taken Off.

The experience of the American Bridge Co. at its Toledo plant in working men at night, is thus stated by Robt. Finch, superintendent:

"Notwithstanding the fact that we have taken off the night force at the plant of the American Bridge Co. we have increased the production of the plant ten percent by doing so. When we took off the night force, we figured that we would do just as much work, but we have been surprised to find that we are doing 10 percent more with our reduced force. Ever since we have been in our new plant we have had trouble keeping men at work on our night shift. They would only stay on at nights until they could get day work some place and the result was that we were breaking in new men all the time and reorganizing our force once and twice a month. Later we tried the scheme of shifting the force, giving them two weeks days and two weeks nights, but this worked no better. Then we decided to cut off the night force altogether, letting out about 100 men, and the result has been pleasing indeed. We can keep the men long enough so that they can get acquainted with their work and their surroundings and besides getting more work we are having fewer accidents."

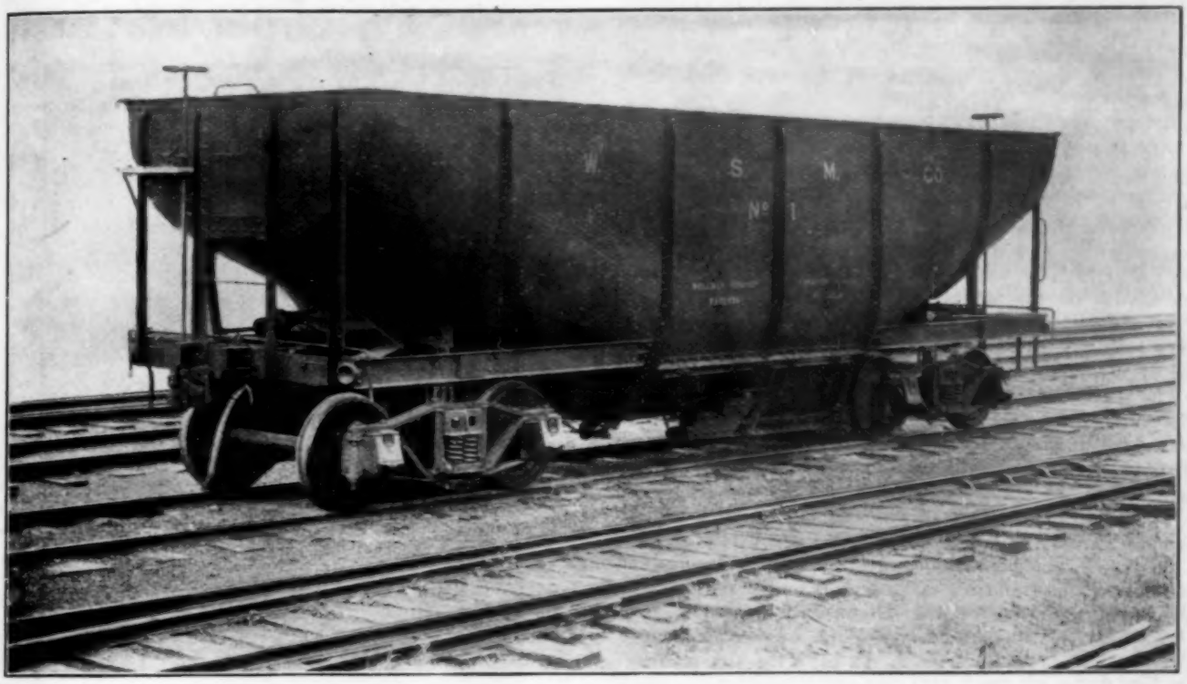
The first triple-expansion direct-acting pumping engine installed in this country was put in by the city of Concord, N. H., eleven years ago. This engine, which was manufactured by the Worthington Co., of New York, was designed to supply 2,000,000 gallons of water per day, which was ample for the needs of the city at that time. The population of Concord has now increased to 20,000 inhabitants, and it was found desirable to increase the pumping equipment in order to maintain reserve capacity. To this end a duplicate engine has been ordered from the Worthington Co. of the same size and type, but embodying the many improvements which have been made in pumping machinery during the period. The steam cylinders are 9, 14 and 22 inches in diameter, and the water ends, which are of the plunger and ring pattern, are provided with 12½ inch plungers, the stroke being 18½ inches. The steam pressure is 100 pounds, and the water pressure created by the pump is the same. The pump receives its water supply by gravity from the Merrimac river at a pressure of 50 pounds, and pumps directly into a reservoir from which the city receives its supply.

The Edward E. Squier & Co., St. Louis, has been installing machinery to screen and handle its molding, core and engine sands.

Judge Kohlsaat appointed W. F. Anderson receiver for the Inland Tool & Machine Co., of Chicago. The liabilities are said to be $15,000 and the assets $12,000.

THE WELLMAN-STREET 50-TON STEEL HOPPER CAR.

The Wellman-Seaver-Morgan Co., of Cleveland, has recently built a steel car of 100,000 pounds capacity, which is a decided departure from any of the designs in use. This car is built under patents issued to S. T. Wellman and Clement F. Street, and its general appearance is shown in the accompanying illustration, which is reproduced from a photograph. The principal object in view by the designers was the reduction of the number of points susceptible to corrosion. Other desirable features were the production of a car which would be self-clearing and one which could be repaired at a low cost. The center sills consist of two 15-inch channels with flanges turned in. A gusset plate is riveted to the outside of each channel and extends from one center plate to the other. An angle-iron is riveted to the lower edge of this gusset plate, giving a girder 27 inches deep at the center, and extending from truck to truck. This girder is designed to have ample strength for carrying the entire load of 100,000 pounds. The side plates are curved, and the customary form of side sill is eliminated. This curved form of plate should enable the car to clear readily, and also have the minimum lineal feet of joint exposed to load. Measurement shows this latter to be 45 percent less than is the customary form of car. The makers claim that as corrosion begins at these points, the life of this car will be very much longer than that of any other in use.



WELLMAN-STREET HOPPER CAR.

The elimination of the customary form of side sill makes a material reduction in dead weight, which weight has been put in the plates of the car where it is believed to be more useful. These plates are 5-16 inch thick, or 1-16 inch heavier than the usual practice. An important advantage claimed is the large area of door openings, which is 56 square feet. In many steel cars this is only from 20 to 25 square feet. This large door opening, together with the curved form of plate employed, should enable the car to clear readily.

The ends of the center sills are tied together by a heavy steel casting, which forms the central part of the end sills. The ends of the end sills are formed of short pieces of 8-inch channels, securely riveted to the steel castings referred to and extending to the side of the car. The push-hole socket is riveted to these channels and also to a short 8-inch channel, which extends from the corner of the car to a heavy steel casting riveted to the side of the car close to the door opening. This construction is further stiffened by two angle irons extending from the corner of the car back to the body bolster near its junction with the center sills. Damage to steel cars is often caused by corner blows, and this construction is designed to enable the car to be easily repaired. The idea is that under a corner blow the only parts receiving damage will be the channels and angles referred to. As these are commercial shapes they can be readily renewed, or if not too badly damaged can be straightened and replaced.

The car illustrated is at the present time in service between Cleveland and Pittsburg, carrying ore and coal. It is giving excellent satisfaction, and the company expects in the near future to begin manufacturing the car.

The Allis-Chalmers Co. will establish a machinery depot at Seattle, Wash., making that city the headquarters for the company's trade in California, Oregon, Washington, British Columbia, Alaska, Montana and Idaho. The company will have warehouse room giving a floor space of between 7,000 and 10,000 square feet. The heavy demand for machinery from Alaska and British Columbia as well as the growth of the manufacturing business elsewhere on the Coast, makes it necessary to establish a depot on the Coast, and Seattle was selected as a point where the business could be handled to advantage. The mining development of Alaska and in the Northwestern States has given the greatest demand for mining machinery that the Northwest has ever known.

A company has been organized to erect and operate the Ferris Wheel during the St. Louis Exposition, and the engineering work of the taking down, transportation and erection of the wheel has been entrusted to Robert W. Hunt & Co. It is estimated that it will involve an outlay of about $125,000. This work will be under the direction of L. V. Rice, who superintended the original erection of the wheel at the Columbian World's Fair, its subsequent taking down and removal and re-erection upon its present site in North Chicago. This will be the only structure from which the whole Louisiana Exposition can be viewed, and there will not be any towers or any other high novelties to compete.

The appraisement of the plant of the Structural Steel Car Co., Canton, O., shows property to the value of $109,571. The buildings and real estate are valued at $30,000. The total indebtedness of the company is placed at $80,000.

TRADE PUBLICATIONS.

Charles G. Shepard, Ellicott Square, Buffalo, N. Y., has a neat pamphlet on Globe pig iron. The advantages of this brand of pig iron are set forth and a number of fine half tones illustrating fractures are given with a statement of approximate analysis.

The Yale & Towne Manufacturing Co., of New York, has an artistically arranged booklet on triplex hoisting apparatus. The illustrations indicate very well the scope of this class of machinery for material handling purposes.

A hurried reprint of the 33A compressor catalogue, edition of 1903, has been found necessary by the Ingersoll-Sergeant Drill Co., of New York. It is issued to tide temporarily over the present demand until the appearance of the fully revised edition which is now in hand. Several new tables have been included and a number of the older ones have been revised in order to bring them thoroughly up to date.

A celluloid holder comes from the Weinman Machine Works, of Columbus, O. The firm manufactures pumping machinery and the holder encloses a table of pump capacity in gallons per stroke. A numbered slit in the holder permits the use of each line of a very compact table separately, the device allowing the use of an extensive table which is at the same time easily read.

A recent pamphlet describes the Diesel engine at some length. The engine is made by the American Diesel Engine Co., of New York, and some interesting data has been collected in regard to this ingenious machine.

The Nernst Lamp Co., of Pittsburg, has prepared a pamphlet which is more in the way of a treatise on this method of illumination than the usual trade catalogue. It has been the work of the electrical engineer who has developed the lamp to its present stage of efficiency, and Mr. A. J. Wurtz has collected some noteworthy reading matter on the subject. The illustrations are highly attractive and will have a peculiar interest to those who have paid any attention to photography at night with all the attendant difficulties.

The Tabor Manufacturing Co., of Philadelphia, has a new catalogue on molding machines. The work is freely illustrated and with the text will be of considerable importance to molders with machine molding possibilities at hand.

Dixon's graphite lubricants is the burden of a recent pamphlet from the Joseph Dixon Crucible Co., of Jersey City, N. J. The booklet includes not only a description of flake graphite and its various sizes and uses, but also gives a description of the Dixon line of lubricating greases and compounds in which graphite is an ingredient, together with full information as to styles of packing, prices, etc.

A circular of users of disc fans together with a descriptive catalogue containing considerable data on the subject is received from the L. J. Wing Manufacturing Co., of New York. The fans are made in a number of sizes and adaptable to various drives and purposes.

A catalogue of ticket punches, metal checks, car and package seals, speed indicators, car pushers, counters, stamps, etc., comes from the R. Woodman Mfg. & Supply Co., of Boston.

The Indianapolis Blue Print Co., of Indianapolis, Ind., submits a conveniently arranged catalogue of 254 pages devoted to architects', engineers' and draftsmen's supplies.

Catalogue No. 7A treats of the trucks and barrows built by the Lansing Wheelbarrow Co., of Lansing, Mich. Many variations of the standard forms are illustrated for steel plants and machine shops in the way of carrying conveniences. One of the novelties is a barrow with a wide wheel grooved to fit the rail of a railroad track, the design of the wheelbarrow being so contrived that the workman can walk alongside the supporting rail, instead of straddling it at every stride.

A fuel saver made by J. H. Clark Co., of Portage, Wis., is exploited in a number of articles reprinted from the daily press and a report from the State Laboratory, at Madison, Wis.

The latest short story from Wyman & Gordon, manufacturers of drop forgings, Worcester, Mass., is a biography of Alexander Lyman Holley. The paper is entertainingly written and well worth a careful reading.

A circular of power and other presses relates to the machines made by the Consolidated Press & Tool Co., of Chicago. The foot press is not overlooked though the power press receives the greater share of attention and the constructive details are given due notice.

Electric light and power wiring of public institutions and private residences is treated in an illustrated circular from the D'Olier Engineering Co., of Philadelphia.

A circular letter from Schuchardt & Schutte, of Cologne, announces the opening of two branch houses in Paris, France and Bilbao, Spain. These are in addition to the agencies already of record in 10 representative cities.

A catalogue of radiators made by the Model Heating Co., of Philadelphia, is not only timely at this season of the year but the discussion of pipe joint design has some mechanical features of interest.

Another installment of the "Arrow" is being distributed by the N. & G. Taylor Co., of Philadelphia, and treats of tin roof requirements.

A price list, No. 34, is from E. T. Lippert, of Pittsburg, and deals with the product of the Pittsburg Saw Works at Pittsburg, as well as the Penn Saw Works, of Millvale, Pa. The pamphlet digresses to emery wheels and stands, and other saw mill supplies.

The Lennox rotary bevel shear and the Lennox rotary splitting shear are illustrated in a recent publication from Joseph T. Ryerson & Son, of Chicago. A number of facsimile letters and other appreciative comment on these tools are submitted.

A folder describes the new line of vertical boring and turning mills brought out by the J. Morton Poole Co., of Wilmington, Del.

The pressed and seamless drawn specialities in steel made by the Pressed Steel Tank Co., of Milwaukee, Wis., are handled well in the catalogue just to hand. The illustrations are carefully chosen and suggest the extent of the field available for sheet steel.

The latest edition of the booklet from the Standard Welding Co., of Cleveland, is devoted to tubing, seamless steel rims, bicycle parts and the general line of electric welding capable of handling by the Thomson process

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Creditors of the Southern Car & Foundry Co., will meet in Chattanooga on Nov 26 to instruct the trustee as to what steps, if any, shall be taken in the "institution of a suit for the recovery of money and property covered by illegal preferences and other assets wrongfully dissipated." The creditors will be asked to decide whether to continue the receivership or have a speedy sale.

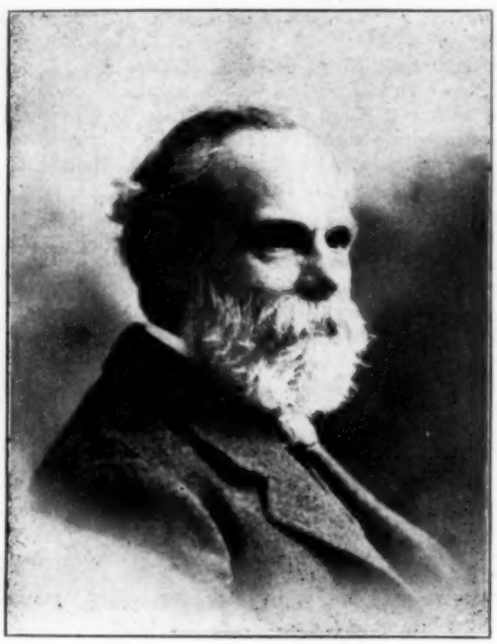
The Ingersoll-Sergeant Drill Co., of New York, has ordered six gondola cars of 100,000 pounds capacity, of the Pressed Steel Car Co., of Pittsburg. These cars are to be 40 feet over end sills and 9 feet 10 inches over side stakes, and equipped with wooden drop ends, Kelso steel couplers 5x7 inches, Westinghouse draft rigging, pressed steel brake beams, arch bar trucks, gray iron journal boxes, M. C. B. journal bearings and wedges, 700-pound wheels and pressed steel bolsters.

The Graham & Morton Co., Chicago, has signed a contract with the Craig Shipbuilding Co., Toledo, for the construction of a passenger boat, 263 feet over all, with 125 state rooms. A distinctive feature of the new steamer will be that all the machinery will be practically in a steel well, rising from the keel to the top of the ship, in order to guard against fire. The vessel is to be finished by June 1 next.

C. R. Stephens, superintendent of the Moline Plow Co. Moline, Ill., has purchased the controlling interest in the Acme Steel Co., of Chicago, recently owned by S. T. Gunderson & Son, Chicago, Messrs. Sawyer, of Carpentersville and Sawyer, of Elgin, and Sellick, of Chicago. Mrs. Stephens expects to make extensive improvements to the plant.

OBITUARY.

Dr. R. H. Thurston, director of the college of mechanical engineering of Cornell University, died suddenly from heart disease on Oct. 25. While sitting in his library, awaiting the arrival of friends who were coming to celebrate his 64th birthday, his life quietly ended. Robert Henry Thurston, C. E., Ph. B., A. M., LL. D., Dr. Eng., mechanical engineer, inventor, educator and author, was born in Providence, R. I., Oct. 25, 1839. In youth he spent much time in the workshops of his father, then devoted especially to the building of steam engines. He graduated at Brown University in 1859, and entered the works of his father's firm, spending some time as designing engineer. In 1861 he joined the Engineer Corps of the United States Navy, serving in Dupont's and Dahlgren's fleets throughout the war. He was a professor of natural philosophy in the U. S. Naval Academy from Jan. 1, 1866, to June, 1871, when he became professor of engineering at Stevens Institute of Technology, resigning in 1885 to assume the directorship of the Sibley College of Mechanical Engineering in Cornell University. Dr. Thurston was employed on many government commissions. He was a member of a number of American and European societies, had been first president of the American Society of Mechanical Engineers, and thrice vice president of the Amer-



ROBERT HENRY THURSTON.

ican Association for the Advancement of Science. Dr. Thurston designed engines, boilers and many kinds of machinery, and wrote about twenty volumes, among which are his "Manual of the Steam Engine" (1890-91), "Manual of Steam Boilers" (1890), "Engine and Boiler Trials" (1890), "History of the Steam Engine" (1878), "Materials of Engineering" (1882-86). He published nearly 300 professional and scientific papers. He was an editor of Science and of Johnson's Cyclopedia, and was an editorial contributor to the Century Dictionary. Dr. Thurston invented magnesium-burning lamps, army and navy signal apparatus, various forms of testing machines for iron and other metals, and to ascertain the quality of lubricants, some improvements on the steam engine, and scientific and engineering apparatus. He performed much work in scientific research and in the investigation of engineering problems. He organized in 1872-73 the first laboratory for research in the applied sciences of engineering in the United States. When organizing Sibley College he made this a separate and prominent part of the institution. Former President Andrew D. White, in speaking of Dr. Thurston's services to the university and of his attainments, said: "Without exception, of all men I have ever met, he had the most astonishing ability for work, and in spite of his onerous duties in directing the college, put forth a great amount of admirable matter, in the form of books, magazine articles, contributions to reviews, and things of that sort." Prof. Durand said: "Sibley College is an expression of the genius of Dr. Thurston as an organizer and educator, and an exponent of his lofty ideals of the engineering profession and of the preparation needful for entrance into its ranks. The college is a monument to the man. Far greater, however, than any monument expressed in buildings, material equipment or a faculty of teachers, is the output into the world of engineering progress which Sibley College has contributed during the relatively short years since its organization took form and it first felt the inspiration of its director and head. The total list of graduates of Sibley College numbers over 1,200, and they are found wherever the the world's work of subduing material nature is in progress."

Gordon McKay, whose inventions revolutionized the boot and shoe industry, died Oct. 18 at Newport, R. I. He was born at Pittsfield, N. H., in 1821 and peddled the stock of his first corporation from door to door among his friends in that city and neighboring towns. When less than 20 years of age he built a machine shop in his native town and later became treasurer and manager of the Lawrence Machine Co. During the war he made large quantities of shoes for the soldiers in his plants in Raynham and Farmington, N. H. Before the end of 1862 he made contracts with nearly 70 firms to which he leased his sewing machines. It is estimated that in less than ten years more than 10,000,000 pairs of boots and shoes made in America paid royalty to Mr. McKay and his company. He formed the McKay Sewing Machine Association in 1878 and it became the central power in one of the greatest monopolies in the world. The association used the machinery invented by Mr. McKay and he became a millionaire.

F. N. Hoffstot, president of the Pressed Steel Car Co. has received a cable message from Walsall, Staffordshire, Eng., announcing the death of Samson Fox, chairman of the Leeds Forge Co., Leeds, Eng. Mr. Fox had only recently returned to England after a visit to this country to see the development of the pressed steel car industry, which he originated at Joliet, Ill., by the erection of a small plant for the construction of the Fox truck. Mr. Fox had risen to eminence in his native country as a manufacturer of steel, furnaces and cars, and had accumulated a considerable fortune. The Leeds Forge Co. was built up by Mr. Fox, and is now a large establishment.

The plate mill, slabbing mill and open-hearth furnaces of the Illinois Steel Co. at South Chicago were shut down last Saturday for a period of two weeks, because of a scarcity of orders. The company has also shut down the 9-inch mill at Milwaukee, which has been working on steel bars, for the same reason. Two furnaces at South Chicago and one at Bridgeport are also out of blast for relining. The billet and rod mill at Joliet was started up again on Monday, and these works are now running full. The mills at Bridgeport and the Union Works are also operating to their full capacity in all departments.

The Vincent Valve Co.'s plant, Sandusky, O., has been sold by E. L. Stephens, referee in bankruptcy, to John G. Schurtz, White Pigeon, Mich. The property has been conveyed to Fred P. Zollinger as trustee to hold pending the incorporation of a new company, to be known as the National Valve Co., with a capital of $100,000, which will operate the plant provided the necessary subscription to stock is received.

The Board of Trade of Lockport, N. Y., has just closed a contract for the location of an Eastern branch of the Lamb Mfg. Co., of Sioux City, Ia., in Lockport. The company is capitalized at $150,000, and manufacturers a patented self-heating sad iron.

The T. F. Moore Co. and the Union Metal Co., Chicago, have been consolidated under the name of Union Metal & Mfg. Co., with a capital stock of $75,000.

NEW BOOKS.

"Iron, Steel and Other Alloys. By Henry Marion Howe. 8vo, 457 pages. Price $5. Boston: Sauveur & Whiting.

Undertaken originally for the use of Prof. Howe's students, this book has been amplified, as the author says, "to meet the needs of practitioners, by giving them a systematic account of the condition of the metallography of iron today, and more particularly to expose to them the present or solution theory of that metallography." Since the publication of Professor Howe's monumental volume on the "Metallurgy of Steel" there have been rapid developments in the higher refinements of metallurgical experiment embraced in the study of metals by the aid of the microscope. The reader of the book before us is brought quickly into the intricacies of the solution theory, the constitution of the various alloys of metals being made clear by the parallel of crystalline rock formation. The chief method used in metallography is explained to be the correlation of the results of an examination, 1, of the structure as revealed by the microscope, 2, of the physical properties of individual alloys, and 3, of the physical properties of series of alloys taken as a whole.

In his general classification of iron and steel the author makes slag-bearing the differentiating line between wrought iron and steel. Wrought iron, he says, differs from the low-carbon steels, essentially in containing the small quantity of slag which the method of manufacturing wrought iron does not eliminate. He modifies the usual classification of iron and steel as follows: "They may be divided (1) according to the presence or absence of slag into (A) the slag-bearing or weld-metal, and (B) the slagless or ingot-metal series; (2) according to their carbon content into (A) low-carbon steel and wrought iron, (B) higher carbon steel and (C) cast iron; (3) according to whether their properties are due chiefly to their carbon or to some other element, into (A) the normal or carbon and (B) the alloy steels and cast irons; and (4) according to the method of manufacture into (A) Bessemer, (B) open-hearth steel, etc."

Later in the book in giving the chief constituents of the iron-carbon compounds, the steels and cast irons, the author makes this summation: (1) In the slowly cooled state of both steel and cast iron, pearlite, a conglomerate of (2) the soft, weak, ductile ferrite, and (3) the hard brittle cementite, in the ratio of 6:1, together with whatever excess of ferrite or cementite is present over and above this ratio, (4) also in the slowly cooled state of cast iron, graphite, a non-metallic, and as it were foreign body, (5) in the suddenly cooled state of both steel and cast iron, austenite. The theory of cast iron adopted by Prof. Howe is founded on the conception of the matrix and graphite, which has latterly come to be associated with his name.

The work is not entirely confined to the deeper investigations into the mysteries of iron and steel, though it will appeal for the most part to students and investigators, who are familiar with cooling curves, micrographs and the theory of eutectic solutions. What will be of special interest and value to many in the operating departments of iron and steel works are the chapters on "Heat Treatment of Steel and Cast Iron," "Progress in the Manufacture of Iron and Steel between 1880 and 1900," "The Blast Furnace" and "Metallurgical Gas Furnaces." These cover about 200 pages of valuable material. The eminence of the author in his special field gives more than ordinary weight to his treatment of the subjects covered by this work, which is an important contribution to the splendid research carried on on both sides of the water in recent years, with only an occasional suggestion of results in papers presented before the technical societies of European countries.

The board of directors of E. S. Wheeler & Co., iron merchants, New Haven, Conn., have decided to file a petition in bankruptcy. The assets are said to be $200,000, with liabilities $250,000.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants.

The Earle Gear & Machine Co., Philadelphia, has been incorporated with a capital of $40,000.

The Miller-McIntyre Machine & Mfg. Co., Rochester, N. Y., has been incorporated with a capital of $30,000 to manufacture engines. The incorporators are: Joseph B. Miller, M. J. McIntyre and Eli H. Eaton.

The Finlay Otten Foundry Co., Buffalo, has been incorporated with a capital of $50,000. The incorporators are: F. B. Bard and E. M. France, New York; R. C. Brower, Brooklyn.

The Green-Ennis Fence Co. has been organized at Reading, Mich., with a capital of $80,000. George E. Crane, president; A. L. Kinney, secretary; and T. F. Doty, treasurer. Machinery has been ordered.

The Bay State Tool Co. has been organized at Augusta, Me., with a capital of $20,000 and the officers are: President, I. L. Fairbanks; treasurer, J. Berry; directors, I. L. Fairbanks, J. Berry and L. A. Burleigh, of Augusta, Me.

The Board-Crosby Co., Chicago, has been organized with a capital of $50,000 to manufacture metal merchandise. The incorporators are: Emil F. Wetton, James J. Jeffery, Charles H. Pegler.

The Automatic Valve Grinding Machine Co., Knoxville, Tenn., has been incorporated with a capital of $200,000.

The Universal Hinge & Mfg. Co., Cleveland, has been incorporated with a capital of $20,000. The incorporators are: H. L. Schneider, F. A. Richardson, Wm. L. Bullard, H. M. O'Malley and Thos. H. Penty.

The Enterprise Boiler Works, Manitowoc, Wis., has been incorporated with a capital of $2,500. The incorporators are: James McNulty, Joseph Hillman and Edward Wirtz.

The West Virginia Boiler & Machine Co., of Mannington, W. Va., has been incorporated to make, buy and sell boilers, stacks, tanks, pumps and all kinds of mining and drilling machinery. Capital $100,000. Incorporators: V. H. Debendarfer, LeRoy Taylor, of Mannington; I. E. Carnahan and W. M. Belcher, of Canton, and R. R. Carnahan, of Smithfield, W. Va.

At Wilmington, N. C., a company will be organized, with capital of $25,000, for erection of machine shops. Those interested are C. W. Worth, B. G. Worth, J. A. Springer, R. S. Collins and others.

Columbia Manufacturing Co., Ramseur, N. C., will buy small boiler and engine soon.

Dublin Iron Works, Dublin, Ga., is in market for shaper and lathe 24x36 inches.

Clark & Hines, Equitable Building, Baltimore, Md., are in the market for following equipment: Ten miles of 45-pound steel relaying rails with angle bars, ten gondola cars, 20-ton capacity, standard gauge; one locomotive, not heavier than thirty tons, standard gauge; one hand car, standard gauge, and one push car, standard gauge. Advise location for inspection.

George B. Johnson, Oxone, Tenn., wants to correspond with manufacturers of mining machinery, including hoists, fans, cars, crushers, washers, etc., and everything necessary for equipping a coking plant.

Miller Wagon Co., Edina, Mo., will buy 75-h. p. boiler and 50-h. p. engine.

J. W. Cregar Agency, Philadelphia, Pa., wants two 500-h. p. watertube boilers and two 400 or 500-h. p. Corliss engines, all second-hand.

The National Cellular Steel Co., of New York City, has been incorporated with a capital of $250,000, to manufacture devices in connection with the construction of flooring, walls, roofs and cars. The directors are: J. Van Vechten Olcott, of New York City; James M. Rude and Martin M. Durrett, of Covington, Ky.; Sidney C. Strickner, of Cincinnati, and H. Neill Wilson, of Pittsfield, Mass.

The Spieler & Winter Mfg. Co. has been incorporated with a capital of $50,000, and has obtained a location in

Syracuse, N. Y., Machine parts will constitute the plant's output.

The R. W. Spacke Machine Co., Indianapolis, Ind., has been incorporated with a capital of $20,000. The directors are: Fred W. Spacke, John Spacke, William Spacke, George Spacke, and Edward Spacke.

The Gwathmey Mfg. Co., Brooklyn, N. Y., has been incorporated with a capital of $25,000, to manufacture machinery and appliances. The directors are C. B. Gwathmey and A. P. Gwathmey, of Brooklyn, and T. H. Ryland, of New York City.

The George D. Hayden Machine Co., Alton, Ill., has been incorporated with a capital of $10,000, to do a machine and foundry business.

The Weil Mfg. Co., Chicago, has been incorporated with a capital of $100,000, to manufacture steel articles. The incorporators are: Arthur Weil, Adolph Schneider, Simon Young.

The stockholders of the Northwestern Barb Wire Co., Rock Falls, Ill., have voted to increase the capital stock of the company from $100,000 to $175,000.

The Rotary Engine & Tool Mfg. Co., Andover, O., has been incorporated with a capital of $50,000. The incorporators are: S. W. Wade, George H. Platt, G. E. Garner, F. A. Butler and H. D. Carpenter.

The Palmetto Metal Co., Chicago, capital $25,000, has been incorporated to manufacture metals.

Fires and Accidents:—

The main part of the shop owned and occupied by the Hopkins Machine Works and Bridgeton Knife Co., in Burrillville, R. I., was destroyed by fire Oct. 16. Loss, $18,000.

The plant of J. K. Petty & Co., Lebanon, Pa., consisting of boiler shop, erecting house, foundry, blacksmith shop, pattern shop, boiler shop and engine room, was totally destroyed by fire Oct. 18. The loss is $30,000, part covered by insurance.

The Bridgeford and Co.'s foundry at Louisville, Ky., was destroyed by fire on Oct. 18. The fire also destroyed the pattern building.

S. B. Stine & Son's foundry and machine shops, at Osceola, Pa., were partially destroyed by fire last week. Loss $10,000.

J. K. Petty & Co.'s boiler works and manufacturing plant, including blacksmith shops, pattern shop, erecting house, Lebanon, Pa., were burned to the ground Oct. 18, entailing a loss of nearly $30,000.

New Construction:—

The American Range & Foundry Co., of Cleveland, will construct a new foundry at the corner of South Union and Echo streets. The building will be of brick and cost $4,000.

The Racine Boat Mfg. Co., Racine, Wis., will remove its plant to Muskegon, Mich., where it will erect a new machine shop, foundry, and the other necessary buildings.

The Sessions Foundry Co., of Bristol, Conn., has let the contract for a brick pattern storehouse, 50x120 feet, four stories high.

The Lewiston Foundry & Machine Co., Lewiston, Idaho, will enlarge its foundry.

The Manufacturers' Foundry Co., Waterbury, Conn., has about completed its new foundry and expects to have it ready for operation by Nov. 1.

The Red Cross Mfg. Co., of Bluffton, Ind., is building a large new fireproof pattern vault at its works and increasing the capacity of the foundry.

The National Steel Foundry Co., New Haven, Conn., began a few days ago, the erection of a new building 165x410 ft., which will cost about $80,000. The company is expending about $200,000 in construction and equipment.

The Northwestern Malleable Iron Co., Milwaukee, Wis., is making improvements in its plant at a cost of $12,000.

The directors of the Pittsburg Valve & Fittings Co., Barberton, O., have decided to erect a large addition to the company's plant in that city. Work will be begun on the new construction this fall.

It is announced that the Kent Foundry Co., Toledo, O., has been purchased by the recently organized Owens Bottling Co. The plant is to be enlarged to double its present capacity and will hereafter be used exclusively for turning out Owens bottle machines.

The Farrell Foundry & Machine Co., Waterbury, Conn., has let the contract for a brick building, three stories, 65x80 ft.

The Kalamazoo Stove Co., Kalamazoo, Mich., has had plans drawn and will build a new warehouse 50x400 feet and a new foundry 240x120 feet.

A new foundry is planned at Red Lake Falls, Minn. A subscription paper was passed among the citizens and necessary money subscribed for the construction of the plant, and it is hoped it will be in operation by spring.

The Mansfield Engineering Co., Mansfield, O., has just completed a foundry which is 95x180 feet. It is equipped with a 15-ton Whiting cupola and a 15-ton air furnace and is spanned by a 25-ton, 4-motor electric traveling crane. The company built this foundry with the object in view of taking care of all kinds of castings, from medium sizes up to 50 or 60 tons. It has two large core ovens in which can be baked about the largest cores made. The general arrangement is such that all the sand, facing, blacking, etc., is unloaded direct from the cars inside of the walls of the foundry, while the general convenience and lay-out of the plant is unusually fine. The plant throughout is a modern one, being equipped in the best manner to handle work to advantage. Its principal lines are the building of automatic steam engines and all classes of special machinery, particular attention being given to rolling mill work.

The J. E. Porter Co., Ottawa, Ill., has started to work on the construction of a new foundry, 60x160 feet, north of the company's machine shop.

The Providence Steel Casting Co., Providence, R. I., has let the contract for its new building, heretofore mentioned. The company was organized a few months ago, and will operate a foundry to be constructed upon a modern basis, 166x118 feet. It is expected that the plant will be in operation about the first of February.

The Canadian Shoe Machinery Co., with headquarters at St. Hyacinthe, Can., and a plant at Haverhill, Mass., has awarded a contract to build a foundry. The company has reorganized and doubled its capital stock to $2,000,000.

The Gartland Mfg. Co., Terre Haute, Ind., has purchased 17 acres of land and will erect a plant 100x300 feet, of brick, equipped with modern machinery. A large acreage was required in order to have room for extensions in future years.

The Crown Machine Works, Terre Haute, Ind., has purchased a building and is preparing to move into its new location and enlarge its present plant.

The Dodwen Mfg. Co., Prairie City, Ia., will erect a foundry 42x62 feet.

The American Range & Foundry Co., Cleveland, will construct a one-story brick building 93x95 feet, at a cost of $4,500.

The Pittsburg and Valley Districts:—

The Shenango plant of the American Tin Plate Co., New Castle, Pa., which was shut down the first of the month will resume operations partially on Monday, Nov. 9. Twenty mills will be placed in operation at that time and the remaining ten will resume in a short time thereafter. Repairs to three of the mill engines are nearly completed, while the new heating furnaces have already been installed. Five additional mills of the Sharon, Pa., plant of the American Tin Plate Co. were placed in operation this week and the remaining five of the twenty will be placed in operation within a few weeks.

The plate department of the Riverside plant of the National Tube Co., Benwood, W. Va., is being given a general overhauling. New tables and equipment are being added so as to make the mill continuous. Extensive improvements are also being made to the steel mill of this plant.

The passenger and freight car shops of the Pittsburg & Western Railroad, Allegheny, Pa., were destroyed by fire last week. Loss, $30,000.

The McKees Rocks, Pa., plant of the Pressed Steel Car

Co. resumed in part this week. Orders for a number of cars have been received and it is hoped that this plant will be able to go on in full shortly. The Allegheny plant of this company continues in idleness.

It is now certain that the South Sharon, Pa., plant of the Carnegie Steel Co. will not resume operations as anticipated on Nov. 1. It is probable that the plant will remain idle during the month of November and possibly through the remainder of the year.

The Ohio plant of the Carnegie Steel Co., Youngstown, O., resumed operations this week after an idleness of only one week. The plant resumed on billets and tin bars instead of rails, however. Blast furnaces Nos. 1 and 3, which were banked, also resumed operations.

The plant of the Lockhart Iron Co., McKees Rocks, Pa., went on double turn this week. It has been operating single turn for some time.

The report from Philadelphia that the Pencoyd plant of the American Bridge Co. would be removed to Ambridge, Pa., where an immense structural fitting plant is under erection, has been officially denied. The bridge plant will not be removed, and while the rolling mills of the company are shut down it has not been decided whether this is for an indefinite period or not. The engineering corps will probably be centralized at Ambridge, however, as an immense building for the engineers of the company has been erected.

General Industrial Notes:—

The D. E. Whiton Machine Co., New London, Conn., has started its new foundry and reports that everything seems to be very satisfactory, the heats taken being so far entirely successful.

At a special meeting in Jersey City a few days ago the International Fire Engine Co. reduced the number of directors from twenty-five to eleven. The new organization is to become effective Oct. 29. A new board of directors was elected as follows: Benjamin P. Cheney, Silas Chapman, Jr., J. R. Clarke, Charles H. Fox, William H. Hall, Peter Murray, George L. Olney, C. Sidney Shepherd, William S. Taylor, C. H. Horton and H. A. Hutchinson.

The Middletown Iron & Tube Works, Harrisburg, Pa., laid off 250 men last week on account of lack of orders. The works employ about 800 men.

Mayor Evan G. Boyd and other citizens of New Castle, Del., are negotiating for the location of a large iron casting plant in that city. The plant will employ about 350 men and boys.

The Elm City Brass & Rivet Co., recently organized at Plainville, Conn., has acquired the plant of the defunct Clark & Cowles Co., and will soon be in full operation manufacturing brass and metal goods.

The foundry and machine shop which has been in operation at Clarissa has been sold to the Itasca Lumber Co., which will move the machinery to Deer, River, Minn.

The Benton Harbor Machine Works, Benton Harbor, Mich., has started to manufacture gasoline engines. It is now building 2½ horsepower but contemplates building all sizes of engines.

H. C. Hunter, Savanna, Ill., has bought the plant of the Crescent Machine & Tool Co., of that city.

The plant of the Fulton Stove Works Co., Fulton, Ill., has been sold for $24,500, to the proprietors of the Charleston Foundry Co., Charleston, Ill. The plant of the Steel Brick Siding Co., of the same city, has been sold to H. E. Bullock, of Chicago, for $1,350.

The Sheridan Iron Works, of Champlain, N. Y., have recently ordered a 70-h. p. direct connected engine from the Ball Engine Co., Erie, Pa.

The Knoxville Iron Co., Knoxville, Tenn., with its new plant, has greatly increased its capacity. It employs about twice as many men as formerly.

The foundry of the Fountain City Drill Co., La Crosse, Wis., has been placed in operation after a shutdown of several months.

The Reynolds Wire Co., Dixon, Ill., has elected the following directors: H. G. Reynolds, Judge R. S. Farrand, W. J. McAlpine, L. D. Dement and Prof. Geo. C. Heritage. The officers are as follows: H. G. Reynolds, president; S. S. Dodge, vice president; W. B. Merriman, treasurer; Geo. C. Heritage, secretary. Mr. McAlpine recently purchased a large block of the stock and becomes a member of the board of directors. The plant is now being run night and day.

The American Tool Co., of Philadelphia, has just taken a large order for steel pulleys from an English concern.

The buildings and machinery of the Washington Foundry & Machine Co., Washington, Pa., have been sold to the Washington Chemical & Supply Co.

On Oct. 13 the first heat was run at the new foundry of the Wickham & Chapman Piano Plate Co., Springfield, O.

The Platteville Foundry Co., Platteville, Wis., has elected the following officers: W. G. Bryant, president; B. F. Huntington, vice president; Morton Eastmon, treasurer; and W. C. Johnson, secretary. The company will erect new buildings, for which it has already broken ground.

The Helmbacher Rolling Mills, at Madison, Ill., were closed down Oct. 20, throwing about 500 men out of employment. It is believed that the mills may be reopened in January.

Tracy C. Becker has been appointed receiver of the New York Car Wheel Works, Buffalo, N. Y., in the involuntary bankruptcy proceedings recently begun.

Henry and Aaron Irmas, doing business as the Irmas Iron & Metal Co., Milwaukee, Wis., filed a petition in bankruptcy Oct. 22. The company carried on a scrap business. The assets are $9,649 and the debts $8,646.

The Commercial Tribune Building, Cincinnati, is installing a new 400 h. p. Watertown engine and a 210 h. p. tubular boiler.

A petition has been filed for the appointment of a receiver for the Acme Harvester Co., of Peoria, Ill. The claims aggregate $27,000. They cite alleged preferential payments as grounds for the application, and charge that the company is insolvent.

The Hamilton Machine Tool Co., Hamilton, O., has declared the regular quarterly dividend of 1½ percent on the preferred stock, payable Nov. 1.

The first steel rail was turned out at the Lackawanna Steel Co.'s plant, Buffalo, Oct. 21. The mills for light rails have not yet been finished.

The Diamond State Steel Co., Wilmington, Del., has received an order from the government for several million steel rivets for battleship construction. It will probably require a year's constant running to complete the contract.

The new charcoal furnace at Standish, Clinton county, N. Y., of the Chateaugay Ore & Iron Co., was blown in Oct. 20. The furnace will turn out about 700 tons of pig iron a week, and is said to be thoroughly modern and well constructed.

The Cambridge Works of the American Sheet Steel Co., has been closed down indefinitely. About 1,000 men are now out of employment in that city.

Every department of the Minnequa plant of the Colorado Fuel & Iron Co. is now active excepting Furnaces A and D, and these will soon be ready to blow in. Other blast furnaces may be built, so that the company will not only have iron for use in its Bessemer plant but also foundry iron for sale. The structural iron work upon the buildings for the new tin plate mill has been completed and the foundations for the heavy machinery have been laid. During the month the converter and rail mill have been working at their full capacity while the rod mill has been in operation day and night. Both the wire and nail mills have materially increased their output. The former is now approximately its full capacity of 375 tons, or 7,500 kegs, per day, while an equal tonnage is credited to the wire mill, the barbed wire mill alone requiring 100 tons of metal to supply its demands.

The Galena Iron Works Co., Galena, Ill., is moving into its new plant, and most of its machinery has been installed. The company has a large number of orders on hand.

Gingrich & Willi, Williamsport, Pa., have thoroughly overhauled the building acquired by them, and will soon have their foundry and machine shop in operation.